Developing financial competencies within the business curriculum: A deferred tax assignment

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ABSTRACT

This paper presents an Excel-based assignment on the topic of accounting for income taxes. The assignment uses a pre-formatted spreadsheet to illustrate how common business transactions can trigger deferred tax balances. The spreadsheet's spinners and pre-packaged calculations allow students to efficiently explore the deferred tax effect of multiple scenarios regarding (1) capital purchase levels and depreciable asset lives, and (2) the amount of prepaid warranty receipts. Graphs embedded in the spreadsheet assist students in financial statement analysis.

The assignment reinforces a number of key business competencies. The topic of accounting for income taxes highlights the relationship between balance sheet and income statement components. Deferred taxes also represent an important link between the accounting and tax perspectives of business transactions. Working with the spreadsheet allows students to develop their ability to incorporate technology as a tool for data analysis. The breadth of the topic presents faculty with an opportunity for interdisciplinary coverage of the material.

Keywords: Accounting for income taxes, deferred taxes, competencies, Excel spreadsheets

INTRODUCTION AND LITERATURE REVIEW

Teaching finance and accounting courses within the business curriculum can pose substantial challenges, particularly in the face of diverse student learning styles, skill sets, career goals, and workplace expectations. Given the challenges, Hamilton and Saunders (2009) state "the charge for finance educators is to design curricula that focus on and systematically develop the decision making skills needed in the workplace while concurrently engaging students in the learning of the finance concepts and methods" (p. 87). The authors suggest that attributes of the current generation of students demand an adaptation of traditional approaches to teaching. On the accounting front, Warren and Young (2011) state "students often bring a negative perception of accounting into class" (p. 247) and anticipate "the first accounting courses will be dominated by 'number crunching' and 'bean counting'" (p. 248). As such, the authors advocate new learning strategies such as active learning pedagogies and an emphasis on critical thinking skills.

French and Coppage (2004) reinforce the need for improved curricular design in the face of specific pressures within the financial profession. These pressures include globalization, technological advances requiring system-oriented analysis, concerns over the adequacy of financial reporting, and a need to understand integrated business activities. More specifically, the authors have proposed a combined undergraduate curriculum for both accounting and finance students that incorporate the following core competencies of financial professionals:

1. Interpersonal and leadership skills;
2. Analytical and problem-solving skills and an understanding of the relationships between the balance sheet, the income statement, and cash flow statements;
3. Technological proficiency;
4. Strategic and critical thinking skills;
5. A focus on the customer, client, and markets; and
6. A strong work ethic. (p. 65)

Many studies on the state of accounting education have identified similar competencies and stressed the need for changes in accounting curriculum and pedagogy. The driving forces for change include the globalization of business, the rapid pace of change, and the increased use of technology (Albrecht & Sack, 2000; Kleinman, Siegel, & Eckstein, 2002). The studies emphasize that accounting education has not kept pace with these changes, which have had a dramatic impact on the accounting profession, and call on educators to improve the educational process (AAA, 1986; AECC, 1990; Albrecht & Sack, 2000; Behn, Ezzell, Murphy, Rayburn, Stith, & Strawser, 2012; White Paper, 1989). For example, the Accounting Education Change Commission (Commission) stresses "education should lay the base on which life-long learning can be built …graduates should be taught how to learn" (AECC, 1990, p. 2). The Commission states knowledge of accounting should be focused on the development of analytical and conceptual thinking rather than memorization of professional standards and emphasizes students "should identify and solve unstructured problems that require use of multiple information sources" (p. 3). The Commission deems creative use of technology to be essential. More recently, the Pathways Commission on Accounting Higher Education, created by the American Accounting Association and the American Institute of Certified Public Accountants, posits "a new generation of students has arrived who are more at home with technology and less patient with traditional teaching methods" (AAA, 2012, p. 12). Although these studies focused on accounting education, Stivers, Onifade, Reynolds, and Alli (2011) believe the recommendations

should serve as a guide for all business students. Walters and Pergola (2012) highlight the emphasis business school accreditation bodies place on technology competency.

An assignment based on the topic of accounting for income taxes, and specifically deferred taxes, offers an opportunity to address the above issues. Accounting for income taxes, by its nature, is an integrated concept in two respects. First, deferred tax calculations draw upon students' understanding of the relationship between the balance sheet and the income statement, which is a key competency presented by French and Coppage (2004). Statement of Financial Accounting Standards (SFAS) No. 109, developed by the Financial Accounting Standards Board in 1992 to address accounting for income taxes, was driven by a conceptual shift to an asset/liability method focusing on the balance sheet rather than the income statement. From an analytical standpoint, students should understand the effect of this shift on the financial statements. Second, deferred taxes are a critical link between the accounting and tax perspectives of business transactions. The Model Tax Curriculum Outline, developed by a special committee of the AICPA (2007), acknowledges "tax and financial reporting considerations often intertwine" and expresses the committee's recommendation that students gain fundamental tax knowledge "because taxation is pervasive, complex, and critical to decision making" (para. 3). Hamilton and Saunders (2009) suggest students should be able to "think creatively and critically about the firm and its activities" (p. 87), and in that light, they must appreciate the tax ramifications of business transactions.

Nellen, McGill, and Outslay (2007) present several factors in support of educators' coverage of accounting for income taxes. The authors highlight a renewed emphasis on tax risk management following the high profile bankruptcies of Enron and WorldCom. Both the Security and Exchange Commission and the Public Company Accounting Oversight Board have added a "transparency through disclosure" filter that affects aggressive interpretation of tax accounting rules. Almost one-third of the material weaknesses identified under Sarbanes Oxley Section 404 internal control audits relate to accounting for income taxes. Based on such issues, Nellen, McGill, and Outslay note that individuals who understand accounting for income taxes are now in high demand, and the international CPA firms have labeled SFAS No. 109 knowledge as a core competency in their tax education programs.

One of the challenges regarding coverage of accounting for income taxes is the placement of the topic within the business curriculum. Nellen, McGill, and Outslay (2007) offer a few considerations. Accounting textbooks frequently present the topic; however, many students have not had a tax course and might be unfamiliar with the transactions leading to book/tax differences. Presentation in a tax course represents a logical fit. The authors note the challenges of finding time within the tax curriculum and the lack of coverage of accounting for income taxes in most tax textbooks. Nellen, McGill, and Outslay point out the conceptual appeal of addressing the topic in an auditing course, since future auditors will need to address the issue of a client's tax provision. Using a similar argument, the deferred tax topic is relevant for finance students who will be working with financial statement analysis in roles such as investment advisors, portfolio managers, lending officers, credit analysts, and bank relationship managers. An easy solution for curriculum placement does not exist, yet the breadth of options reinforces the importance of the topic within the business curriculum.

This paper embraces the wisdom of developing the financial professional competencies called for by previous research and reports. The paper presents an interactive assignment (Assignment) that exposes business students to the book/tax treatment of various business transactions. After students gain a basic understanding of how deferred tax balances are created

and changed, the Assignment, in the context of deferred tax, reinforces student comprehension of financial statement components, construction, and linkages. The Assignment focuses on a firm's balance sheet and income statement, but it also helps students address the working capital/cash flow impact of various inputs connected to rates of return on depreciable asset purchases and expense percentages associated with receipts of prepaid income.

From a technology standpoint, use of a pre-formatted spreadsheet (Spreadsheet) efficiently illustrates how common business transactions can trigger deferred tax balances. The Spreadsheet's spinners and pre-packaged calculations allow students to quickly work through numerous examples and to "gain a broader understanding of…financial problems and their solutions, than would otherwise be possible" (Mangiero, Manley, & Mollica, 2010, p. 91). Working with the Spreadsheet reinforces to students that quality design is as important to finance and accounting students as "…good grammar, punctuation, style, and content organization are important to well-written prose" (Barnes, Tufte, & Christensen, 2009, p. 117). The hands-on experience exposes the likelihood that students "…when designing a model to solve a finance problem…have limited knowledge of which Excel features they need to use, when they need to use them, and why they need to use them" (Balik, 2009, p. 411).

FEATURES OF THE ASSIGNMENT'S SPREADSHEET

The Spreadsheet demonstrates how management assumptions relative to asset purchase levels and warranty contract receipts can generate deferred tax liability and asset balances, respectively, and how these balances can change over time. An electronic copy of the spreadsheet can be obtained from the lead author upon request. When introducing the Spreadsheet to students, instructors should emphasize that while annual expense and revenue recognition may vary between a firm's financial statements and its tax return, total income recognition will not.

Depreciable Assets

As presented in Figure 1, students can input, through the use of sliders for years 2012-2021, the annual dollar value of purchases within a $0 to $500,000 range and in $5,000 increments. For tax depreciation purposes, students can then input what portion of the assets fall within three classes of Modified Accelerated Cost Recovery System ("MACRS") property: three-year, five-year, and seven-year property. The instructor can provide for students examples of assets that fall within each category. A "Check" key embedded in the Spreadsheet allows students to determine whether the distribution of purchases among the three types of property matches the annual purchases for each year. Finally, for each class of MACRS property, students input a corresponding life for financial statement purposes using the following ranges:

3 year MACRS property	2-6 years
5 year MACRS property	4-8 years
7 year MACRS property	7-10 years

For purposes of the assignment, the following assumptions are employed:

1. All assets are held until fully depreciated.
2. All assets have zero salvage value.
3. A half-year convention is employed (i.e., assets are assumed to be purchased halfway through the year of purchase).
4. Neither "bonus" depreciation nor Sec. 179 immediate expensing applies for tax depreciation purposes.

A "Clear All" button allows students to clear the worksheet and to start over. By experimenting with different input assumptions, students can begin to see the relationship between purchase level assumptions over time and corresponding deferred tax liability balances.

Once students input the above information, the Spreadsheet supplies the following, as illustrated in Figures 2 and 3:

1. The tax basis of all assets purchased (i.e., cost less accumulated MACRS depreciation), year over year.
2. The net book value of all assets purchased (i.e., cost less accumulated financial statement depreciation), year over year.
3. The difference between the tax basis and the net book value, year over year.
4. The resulting deferred tax liability balance, derived by taking the above difference by an assumed tax rate of 30%. (Note: Students will observe the Spreadsheet can produce deferred tax asset balances depending on the financial statement depreciation lives selected.)
5. A reconciliation of the above "balance sheet" approach to deriving a deferred liability (asset) balance with an "income statement" approach. More specifically, the Spreadsheet reflects how the year-end deferred tax balance equals the assumed tax rate of 30% multiplied by the difference between each year's financial statement depreciation and MACRS depreciation. To access detailed calculations for MACRS and financial statement depreciation for all years, instructors can give students access to Spreadsheet schedules that are currently hidden.
6. A line graph illustrating the asset purchase level, MACRS (tax) depreciation, financial statement depreciation, and deferred tax liability balances from 2012-2021.

Prepaid Income

Shifting to prepaid income, students can input, as presented in Figure 4, the amount of cash received for three-year warranty contracts within a $0 to $500,000 range and in $5,000 increments. For financial statement purposes, cash received is assumed to be earned as follows:

Year of receipt	16.67%
Year following year of receipt	33.33%
Second year following year of receipt	33.33%
Third year following year of receipt	16.67%
Total	100.00%

The instructor should inform students that for tax purposes, Rev. Proc. 2004-34, 2004-22 I.R.B. 991 permits two options for recognition of prepaid service income: full inclusion in the year of receipt or recognition using the deferral method. Under the deferral method, taxpayers generally report income in the year of receipt to the extent receipts are reflected as income on the financial statements. The balance of the receipts is reported as income in the following year. The Spreadsheet reflects the deferral method and therefore recognizes income as follows:

Year of receipt	16.67%
Year following year of receipt	83.33%
Total	100.00%

After experimenting with different scenarios, students will appreciate that while annual differences exist between financial statement and tax return income recognition, total income recognition over the life of the three-year contracts is the same. Another "Clear All" button allows students to clear the worksheet and to start over.

Once students input the warranty contract receipts, the Spreadsheet supplies the following, as illustrated in Figures 5 and 6:

1. The unearned revenue (liability) balance on the financial statements (i.e., total cumulative receipts less total cumulative revenue earned for financial statement purposes), year over year.
2. The unearned income for tax purposes (i.e., total cumulative receipts less total cumulative income recognized under the deferral method), year over year.
3. The difference between the two above unearned balances, year over year.
4. The resulting deferred tax asset balance, derived by taking the above difference by an assumed tax rate of 30%.
5. A reconciliation of the above "balance sheet" approach to deriving a deferred asset balance with an "income statement" approach. More specifically, the Spreadsheet reflects how the year-end deferred tax balance equals the assumed tax rate of 30% multiplied by the difference between each year's financial statement revenue recognition and taxable income recognition. To allow viewing of detailed calculations for financial statement and taxable income recognition, instructors can give students access to Spreadsheet schedules that are currently hidden.
6. A line graph illustrating the cash received for the warranty contracts, the taxable income recognized, the financial statement revenue recognized, and deferred tax asset balances from 2012-2021.

Financial Statement Impact

This section of the Spreadsheet carries forward information contained in the Depreciable Asset and Prepaid Income subsections described above. Within this section, students add additional inputs on asset rates of return and operating expenses, respectively. For the depreciation analysis, as shown in Figure 7, the Spreadsheet presents:

1. Annual equipment purchase amounts provided by students

2. Year-end equipment balances
3. Year-end Accumulated depreciation balances
4. Annual financial statement depreciation expense
5. Year-end deferred tax liability (or asset) balances

The amounts are shown within an accounting equation format allowing students to recapture some of their working knowledge of balance sheet components. The four far-right columns of the accounting equation depict income statement information: income before depreciation and tax ("income"), depreciation expense, income tax expense, and net income. These amounts allow students to see the correlation between annual income and the cumulative year-end retained earnings balance, assuming no dividend distributions. The income is derived from student input on the assumed rate of return on cumulative equipment purchases within a 5-25% range and in 1% increments. The Spreadsheet computes tax expense using a 30% rate applied to income less depreciation expense. From a strategic perspective, the Spreadsheet demonstrates the impact on a firm's working capital caused by student assumptions related to asset purchases and associated rates of return. Specifically, working capital is reduced by the purchase of assets and later increased by the return generated through the use of the assets. As demonstrated in Figure 8, the Spreadsheet highlights the interaction of the various components from the balance sheet and income statement.

As shown in Figure 9, the Spreadsheet presents a similar format carrying forward the following:

1. Annual warranty contract cash receipts
2. Year-end unearned revenue balances
3. Annual warranty revenue recognized
4. Year-end deferred tax asset balances

As before, the amounts are formatted within an accounting equation. The four far-right columns capture slightly different income statement information: warranty revenue, warranty expense, income tax expense, and net income. Warranty expense is based on student input on the assumed percentage of operating expenses connected to the revenue recognized within an 80-120% range and in 1% increments. The Spreadsheet computes tax expense using a 30% rate applied to the difference between warranty revenue and warranty expense. The Spreadsheet allows students to understand the impact of their assumptions related to warranty receipts and the associated expense on the firm's balance sheet. Once again, student can see the relationship of net income and retained earnings. Students gain a deeper understanding by reconciling the various balance sheet accounts, which highlights the effect of customer cash receipts, rather than warranty revenue recognized. The relationships are demonstrated in Figure 10.

The authors have elected to keep the Depreciable Assets and Prepaid Income sections separate. One extension of the Assignment could be to challenge students to merge the topics, which would result in the creation of deferred tax assets and liabilities.

THE ASSIGNMENT

With a combined investment of $300,000, Bridget Thomas and Maggie Kennedy incorporated White Lightning Golf, Inc. ("WLG") on January 1, 2012. WLG manufactures golf carts and sells them to golf courses throughout Illinois. In reviewing national expansion plans, WLG is considering whether to purchase various specialty manufacturing tools (three-year MACRS property), computer and peripheral equipment (five-year MACRS property), and manufacturing equipment (seven-year MACRS property). WLG plans to offer three-year warranty contracts to its customers. WLG would like to forecast how various capital purchases and warranty contract receipts will impact deferred asset and liability balances in the financial statements.

Instructions

After reviewing the documents/videos contained in Exhibit 1 (Appendix), use the three pre-formatted Excel workbooks entitled Depreciation, Prepaid Income and Financial Statements, respectively, to complete the following:

Part 1: Depreciation Workbook

Using the sliders within the Input Page, enter the information for the following five scenarios and save and submit the calculation results. Save each scenario as a separate Excel file or file tab.

1. Purchases in 2012, totaling $150,000, evenly spread among 3, 5, and 7 year MACRS property; financial statement ("book") lives of 4, 6, and 8 years, respectively.
2. Purchases every year from 2012 to 2021, totaling $150,000 each year, evenly spread among 3, 5, and 7 year MACRS property; book lives of 4, 6, and 8 years, respectively.
3. Purchases every year from 2012 to 2021, beginning with $150,000 in 2012, evenly spread among 3, 5, and 7 year MACRS property, and increasing by $15,000 each year ($5,000 increase in each class of 3, 5, and 7 year MACRS property) through 2021; book lives of 4, 6, and 8 years, respectively.
4. Purchases every year from 2012 to 2021, beginning with $150,000 in 2012, evenly spread among 3, 5, and 7 year MACRS property, and decreasing by $15,000 each year ($5,000 decrease in each class of 3, 5, and 7 year MACRS property) through 2021; book lives of 4, 6, and 8 years, respectively.
5. Purchases every year from 2012 to 2021, beginning with $150,000 in 2012, evenly spread among 3, 5, and 7 year MACRS property, increasing by $15,000 each year ($5,000 increase in each class of 3, 5, and 7 year MACRS property) through 2016, and decreasing by $15,000 each year thereafter ($5,000 decrease in each class of 3, 5, and 7 year MACRS property) through 2021; book lives of 4, 6, and 8 years, respectively.

Using the Spreadsheet-generated line graphs, prepare and submit a 1-2 page analysis of the relationship among MACRS depreciation, financial statement depreciation, and the deferred tax liability balance as asset purchase levels (1) increase each year, (2) decrease each year, and (3) remain constant each year.

Part 2: Prepaid Income Workbook

Using the sliders within the Input Page, enter the information for the following five scenarios and save and submit the calculation results. Save each scenario as a separate Excel file or file tab.

1. Receipts in 2012, totaling $150,000.
2. Receipts every year from 2012 to 2021, totaling $150,000 each year.
3. Receipts every year from 2012 to 2021, beginning with $150,000 in 2012, and increasing by $15,000 each year.
4. Receipts every year from 2012 to 2021, beginning with $150,000 in 2012, and decreasing by $15,000 each year.
5. Receipts every year from 2012 to 2021, increasing by $15,000 each year through 2016, and decreasing by $15,000 each year thereafter through 2021.

Using the Spreadsheet-generated line graphs, prepare and submit a 1-2 page analysis of the relationship among taxable income recognized, financial statement revenue recognized, and the deferred tax asset balance as warranty contract receipts (1) increase each year, (2) decrease each year, and (3) remain constant each year.

Part 3: Financial Statement Workbook

The capital asset purchase levels for Scenario #3 in Part 1 have been preloaded into the financial statement workbook. Use the sliders to input the following assumed rates of return on cumulative equipment purchases. Save and submit the calculation results using separate Excel files or file tabs for each scenario.

1. 25%
2. 20%
3. 15%
4. 10%
5. 5%

Using the above results and the Spreadsheet-generated graphs, prepare and submit a 2-3 page document addressing the following questions:

1. Explain why the scenario generates year-end deferred tax liability balances rather than deferred tax asset balances.
2. Describe the impact of the assumed return on asset purchases on year-end deferred tax liability balances. Explain.
3. As the assumed return on asset purchases declines from 25% to 5%, describe how the slope of the following lines changes: annual income recognized, retained earnings, current assets, and the deferred tax liability balance. Explain.
4. How many of the return scenarios produce income in 2012? In 2013? In at least 9 years between 2012 and 2021? In all years between 2012 and 2021?

5. Describe the relationship between current assets and annual income recognized when returns equal or exceed 20% and when returns equal 15% or less. Explain.
6. Describe the relationship between annual income recognized and retained earnings when returns equal or exceed 15% and when returns equal 10% or less. Explain.
7. Does the increase in each year's deferred tax liability balance increase or diminish the year-end current asset balance? Explain.
8. Describe the impact of annual depreciation expense on income recognized, income tax expense, and current assets. Explain.
9. Assuming current asset deficiencies need to be financed at a 10% annual rate, describe generally how the incremental interest expense would impact income recognized, retained earnings, current assets, and deferred tax liability balances in the 15% return scenario. Would the impact help you assess the acceptability of a 15% return?
10. If the assumed income tax rate changes from 30% to 40%, project the effect on income recognized, retained earnings, current assets, and deferred tax liability balances in the 25% return scenario.

The warranty contract receipts for Scenario #3 in Part 2 have been preloaded into the workbook. Use the sliders to input the following warranty expense rates (expressed as a percentage of revenue). Save and submit the calculation results using separate Excel files or file tabs for each scenario.

1. 80%
2. 90%
3. 100%
4. 110%
5. 120%

Using the above results and the Spreadsheet-generated graphs, prepare and submit a 2-3 page document addressing the following questions:

1. Explain why the scenario generates year-end deferred tax asset balances rather than deferred tax liability balances.
2. Describe the impact of the assumed warranty expense as a percentage of warranty revenue on year-end deferred tax asset balances. Explain.
3. As the assumed warranty expense increases from 80% to 120%, describe how the slope of the following lines changes: annual income recognized, retained earnings, current assets, and the deferred tax asset balance. Explain.
4. How many of the return scenarios produce income in 2012? In all years between 2012 and 2021?
5. Describe the relationship between current assets and annual income irrespective of the warranty expense assumed. Explain.
6. Describe the relationship between annual income recognized and retained earnings when warranty expense equals or exceeds 110% of revenue and when warranty expense is less than or equal to 90% of revenue. Explain.
7. Does the increase in each year's deferred tax asset balance increase or diminish the year-end current asset balance? Explain.

8. Assuming current asset balances can generate a 5% annual return, describe generally how the incremental interest income would impact income recognized, retained earnings, current assets, and deferred tax asset balances.
9. If the assumed income tax rate changes from 30% to 40%, project the effect on income recognized, retained earnings, current assets, and deferred tax asset balances.

STUDENT FEEDBACK

Summary of Student Feedback

The Assignment was integrated into a foundation MBA finance class that covers financial statement analysis, time value of money, valuation of stocks and bonds, risk/return modeling, and capital budgeting techniques (e.g. net present value and internal rate of return). A brief summary of student work within each of the three workbooks follows.

Depreciation analysis

- Generally, students appeared to successfully utilize Spreadsheet graphs to assess trends in MACRS depreciation, financial statement depreciation, and deferred tax liability balances throughout the ten-year period.
- The more astute students understood the relationship between financial statement income exceeding taxable income and the triggering of deferred tax liability (i.e., grasped how accelerated depreciation under MACRS versus straight-line depreciation for financial statement purposes resulted in lower taxable income, at least in the early years, and reduced current year tax liability).
- Relative to Scenario 3, one student captured how increasing asset purchases, year over year, contributed to increasing deferred tax liability balances: "When asset purchase levels increase, book and tax depreciation continue to rise. Book depreciation will keep on getting closer to the higher tax depreciation, but will never catch the tax depreciation. The book depreciation eventually rises at the same rate as the tax depreciation. The deferred tax liability rises steadily, but at a slower rate."

Prepaid income analysis

- Once again, students generally appeared to be successful in utilizing Spreadsheet graphs to assess trends in taxable warranty revenue, warranty revenue for financial statement purposes, and deferred tax asset balances throughout the ten-year period.
- The more astute students recognized that differences between tax and financial statement warranty revenue recognition initially triggered a deferred tax asset balance (i.e., grasped how deferred tax asset balances stemmed from reduction in the deferral period for prepaid warranty receipts under applicable tax law.)
- Relative to Scenario 3, one student summarized the resulting relationships: "As warranty contract receipts increase, financial statement revenue and taxable income continue to rise with the financial statement revenue getting very close to taxable income, and taxable income getting very close to receipts. Eventually, financial statement revenue, taxable income, and warranty receipts all rise at the same rates. Deferred tax assets steadily rise, but at a slower rate than the financial statement revenue recognized or taxable income recognized."

Financial statement analysis

By exploring several scenarios related to purchases of capital assets and issuance of warranty contracts, one student in particular demonstrated a strong grasp of the key concepts and observed the following in her analysis of the resulting financial statements:

- Assumed returns of 15% or more on cumulative equipment balances generated annual net income and increasing balances in retained earnings and current assets throughout the ten-year period. In contrast, the student recognized that returns of less than 10% generated annual net losses and decreasing balances in retained earnings and current assets.
- Deferred tax liability balances did not hinge on assumed rates of returns on equipment balances but rather on the level of assets purchased throughout the period.
- Annual increases in deferred tax liability also increased current asset levels based on the tax savings generated by accelerated MACRS depreciation deductions.
- Current asset and net income levels declined as warranty expense (as a percentage of warranty revenue) increased.
- Assumed warranty expense percentages of less than 100% of warranty revenue generated annual net income and increasing balances in retained earnings and current assets throughout the ten-year period. In contrast, the student recognized that expense percentages of more than 100% generated annual net losses and decreasing balances in retained earnings.
- Deferred tax asset balances did not hinge on assumed warranty expense percentages but rather on the level of warranty receipts throughout the period.

CONCLUSIONS AND FURTHER RECOMMENDATIONS

From the perspective of accounting for income taxes, and based on a review of student feedback, the Assignment is a useful exercise to instill an understanding of how the differing tax and financial statement treatment of transactions leads to deferred tax liabilities and assets. Students recognized the effect of asset purchases and depreciation in generating deferred tax liabilities and of prepaid warranties in generating deferred tax assets. The use of spinners and multiple scenarios created a dynamic interaction within the financial elements that would not occur with a single set of data. The Spreadsheet graphs, as illustrated in Figures 8 and 10, assisted students in their analysis of data trends. Some, but not all, students demonstrated a grasp of the relationships within the financial statements.

One recommendation to deepen student understanding of the financial statement components is to have students quantify, rather than merely describe, the relationships between the components (Assignment questions 5-8 for depreciation and 5-7 for prepaid income). In the classroom setting, this could be achieved by presenting numeric reconciliations for 2012 and asking students to work in groups and reconcile a future year or two. Another recommendation to broaden the interdisciplinary benefits of the Assignment is to develop faculty partnerships to address specific aspects within different disciplines. For example, a tax course might emphasize the nature of the deferred tax accounts and the underlying tax treatment of business transactions; an accounting course might emphasize the relationships between the financial statement components; and a finance course might emphasize the graphs and develop financial ratios based on the results. If time does not allow full coverage of the assignment, a single scenario could be assigned to students or the scenarios could be divided between student groups. Further, the

questions presented in the Instructions could be split between classroom discussion and assignment for a written paper.

Beyond the topical understanding of deferred taxes, the Assignment reinforces a number of key competencies for business students. Students gain practice in working with spreadsheets, which is a technology that business students are likely to encounter in their careers (Walters & Pergola, 2012). The preformatted statements and use of spinners allow students to efficiently focus on analysis of the output, and the analysis is a critical component of the Assignment. Finally, students have the opportunity to reinforce their basic conceptualization of the financial statements and to explore a number of relationships within and between the statements.

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APPENDIX

Exhibit 1 (Supplementary Reading)

1. SFAS 109 Accounting for Income Taxes: An Overview With Examples" by Vernon Martin, National Public Accountant, 2001. http://www.thefreelibrary.com/SFAS+109+Accounting+for+Income+Taxes%3a+An+Overview+With+Examples.-a070912689

2. Ken Boyd – Deferred tax assets and liabilities – You Tube Videos:
   a. http://www.youtube.com/watch?v=dWHBonFQINA
   b. http://www.youtube.com/watch?v=8FrOhg2PLpQ

3. Webinar: http://www.bdo.com/publications/tax/seminar/Mar22-TEIAsia-FAS109-Webinar.pdf

Figure 1 (Depreciation: Scenario 3 Input Page)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	**Input Page**																			
2		**2012**		**2013**		**2014**		**2015**		**2016**		**2017**		**2018**		**2019**		**2020**		**2021**
3	Assets Purchased	$150,000		$165,000		$180,000		$195,000		$210,000		$225,000		$240,000		$255,000		$270,000		$285,000
4																				
5	**Tax**																			
6	3 yr. MACRS Property	$50,000		$55,000		$60,000		$65,000		$70,000		$75,000		$80,000		$85,000		$90,000		$95,000
7	5 yr. MACRS Property	$50,000		$55,000		$60,000		$65,000		$70,000		$75,000		$80,000		$85,000		$90,000		$95,000
8	7 yr. MACRS Property	$50,000		$55,000		$60,000		$65,000		$70,000		$75,000		$80,000		$85,000		$90,000		$95,000
9	Total	$150,000	SUM	$165,000	SUM	$180,000	SUM	$195,000	SUM	$210,000	SUM	$225,000	SUM	$240,000	SUM	$255,000	SUM	$270,000	SUM	$285,000
10		OK	Check	OK	Check	OK	Check	OK	Check	OK	Check	OK	Check	OK	Check	OK	Check	OK	Check	OK
11																				
12	Clear All																			
13																				
14																				
15	**Financials**																			
16	3 yr. MACRS Property - Book Life	4		4		4		4		4		4		4		4		4		4
17	5 yr. MACRS Property - Book Life	6		6		6		6		6		6		6		6		6		6
18	7 yr. MACRS Property - Book Life	8		8		8		8		8		8		8		8		8		8
19																				
20		**2012**		**2013**		**2014**		**2015**		**2016**		**2017**		**2018**		**2019**		**2020**		**2021**
21	Cumulative Deferred Tax Liability	($6,081)		($19,785)		($34,399)		($46,871)		($57,089)		($65,744)		($73,006)		($79,277)		($84,704)		($90,131)

Figure 2 (Depreciation: Scenario 3 Output Page)

	A	B	C	D	E	F	G	H	I	J	K
1	**Output Page**										
2		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
3	Total Fixed Assets	$150,000	$315,000	$495,000	$690,000	$900,000	$1,125,000	$1,365,000	$1,620,000	$1,890,000	$2,175,000
4	Less: MACRS Accumulated Deprecation	$33,810	$121,471	$243,310	$391,862	$563,213	$755,501	$966,584	$1,194,674	$1,437,764	$1,695,854
5	(1) Tax Basis	$116,190	$193,529	$251,690	$298,138	$336,787	$369,500	$398,417	$425,327	$452,237	$479,147
6											
7	Total Fixed Assets	$150,000	$315,000	$495,000	$690,000	$900,000	$1,125,000	$1,365,000	$1,620,000	$1,890,000	$2,175,000
8	Less: Book Accumulated Depreciation	$13,542	$55,521	$128,646	$235,625	$372,917	$536,354	$723,229	$930,417	$1,155,417	$1,395,417
9	(2) Net Book Value	$136,458	$259,479	$366,354	$454,375	$527,083	$588,646	$641,771	$689,583	$734,583	$779,583
10											
11	(3) Difference: (1) - (2)	($20,268)	($65,950)	($114,664)	($156,237)	($190,296)	($219,146)	($243,354)	($264,257)	($282,347)	($300,437)
12											
13	(4) Deferred Tax Liability Balance: (3) x Tax Rate	($6,081)	($19,785)	($34,399)	($46,871)	($57,089)	($65,744)	($73,006)	($79,277)	($84,704)	($90,131)
14											
15	**Proof of Deferred Tax Liability Balance**										
16		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
17	(1) Current Year - MACRS vs. Book Depreciation	$20,268	$45,682	$48,714	$41,573	$34,059	$28,850	$24,208	$20,903	$18,090	$18,090
18	(2) Current Year Change in Deferred Tax Balance: (1) x Tax Rate	$6,081	$13,705	$14,614	$12,472	$10,218	$8,655	$7,262	$6,271	$5,427	$5,427
19	(3) Cumulative Deferred Tax Liability Balance	($6,081)	($19,785)	($34,399)	($46,871)	($57,089)	($65,744)	($73,006)	($79,277)	($84,704)	($90,131)

Figure 3 (Depreciation: Scenario 3 Graph)

Year	Asset Purchase Level	MACRS (Tax) Depreciation	Fin. Statement Depreciation	Def. Tax Liability Balance
2012	$150,000	$33,810	$13,542	$6,081
2013	$165,000	$87,661	$41,979	$19,785
2014	$180,000	$121,839	$73,125	$34,399
2015	$195,000	$148,552	$106,979	$46,871
2016	$210,000	$171,351	$137,292	$57,089
2017	$225,000	$192,288	$163,438	$65,744
2018	$240,000	$211,083	$186,875	$73,006
2019	$255,000	$228,090	$207,188	$79,277
2020	$270,000	$243,090	$225,000	$84,704
2021	$285,000	$258,090	$240,000	$90,131

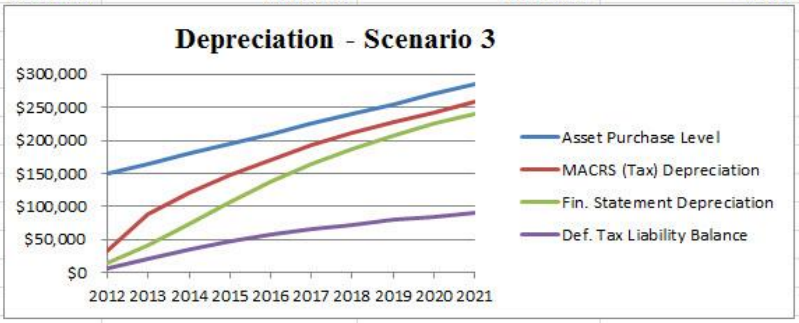

Figure 4 (Prepaid Income: Scenario 3 Input Page)

Input - Prepaid Income	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cash received for 3yr warranty contracts	$150,000	$165,000	$180,000	$195,000	$210,000	$225,000	$240,000	$255,000	$270,000	$285,000
Financial statement revenue recognition	$25,000	$77,500	$135,000	$172,500	$187,500	$202,500	$217,500	$232,500	$247,500	$262,500
Taxable income recognized under the deferral method	$25,000	$152,500	$167,500	$182,500	$197,500	$212,500	$227,500	$242,500	$257,500	$272,500
Difference	$0	($75,000)	($32,500)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)

Clear All

Figure 5 (Prepaid Income: Scenario 3 Output Page)

Output - Prepaid Income	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
(1) Unearned revenue financial statements	$125,000	$212,500	$257,500	$280,000	$302,500	$325,000	$347,500	$370,000	$392,500	$415,000
(2) Unearned income tax purposes	$125,000	$137,500	$150,000	$162,500	$175,000	$187,500	$200,000	$212,500	$225,000	$237,500
(3) Difference: (1) - (2)	$0	$75,000	$107,500	$117,500	$127,500	$137,500	$147,500	$157,500	$167,500	$177,500
(4) Deferred Tax Asset Balance: (3) x Tax Rate	$0	$22,500	$32,250	$35,250	$38,250	$41,250	$44,250	$47,250	$50,250	$53,250

Proof of Deferred Tax Asset Balance	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
(1) Current Year - Book vs. Tax Income	$0	($75,000)	($32,500)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)
(2) Current Year Change in Deferred Tax Asset Balance: (1) x Tax Rate	$0	($22,500)	($9,750)	($3,000)	($3,000)	($3,000)	($3,000)	($3,000)	($3,000)	($3,000)
(3) Cumulative Deferred Tax Asset Balance	$0	($22,500)	($32,250)	($35,250)	($38,250)	($41,250)	($44,250)	($47,250)	($50,250)	($53,250)

Figure 6 (Prepaid Income: Scenario 3 Graph)

	A	B	C	D	E
1	Year	Cash Received for Warranty Contracts	Taxable Income Recognized	Financial Statement Revenue Recognized	Deferred Tax Asset Balance
2	2012	$150,000	$25,000	$25,000	$0
3	2013	$165,000	$152,500	$77,500	$22,500
4	2014	$180,000	$167,500	$135,000	$32,250
5	2015	$195,000	$182,500	$172,500	$35,250
6	2016	$210,000	$197,500	$187,500	$38,250
7	2017	$225,000	$212,500	$202,500	$41,250
8	2018	$240,000	$227,500	$217,500	$44,250
9	2019	$255,000	$242,500	$232,500	$47,250
10	2020	$270,000	$257,500	$247,500	$50,250
11	2021	$285,000	$272,500	$262,500	$53,250

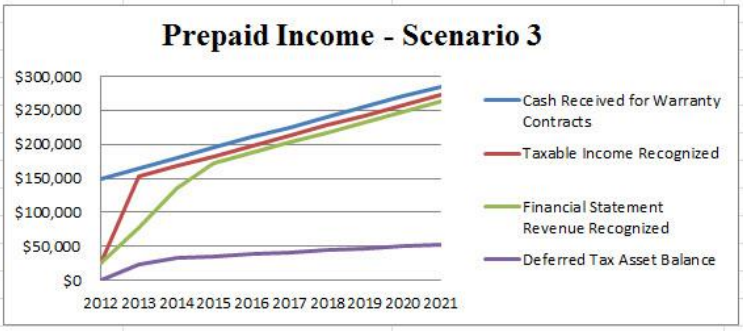

Figure 7 (Financial Statement Depreciation Workbook: Scenario 3)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	**Scenario Three - Depreciation**														
2	**Financial Statements**														
3						2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
4		Asset Purchases				$150,000	$165,000	$180,000	$195,000	$210,000	$225,000	$240,000	$255,000	$270,000	$285,000
5															
6									Income						
7		Current							before			Net		Return on	
8		Assets	Equip.	Acc. Depr.	=	Def. tax	PIC	RE	Depr/Tax	Depr. Exp.	Tax Exp.	Income		Equip.	
9	Beg.	$300,000					$300,000								
10	2012	$186,394	150,000	($13,542)		$6,081	$300,000	$16,771	$37,500	($13,542)	($7,187)	$16,771		25%	
11	2013	$102,816	315,000	($55,521)		$19,785	$300,000	$42,510	$78,750	($41,979)	($11,031)	$25,740			
12	2014	$45,693	495,000	($127,646)		$34,399	$300,000	$78,648	$123,750	($72,125)	($15,488)	$36,138			
13	2015	$16,309	690,000	($235,625)		$46,871	$300,000	$123,813	$172,500	($107,979)	($19,356)	$45,165			
14	2016	$15,214	900,000	($372,917)		$57,089	$300,000	$185,208	$225,000	($137,292)	($26,312)	$61,396			
15	2017	$44,775	1,125,000	($536,354)		$65,744	$300,000	$267,677	$281,250	($163,437)	($35,344)	$82,469			
16	2018	$106,996	1,365,000	($723,299)		$73,006	$300,000	$375,691	$341,250	($186,945)	($46,292)	$108,014			
17	2019	$203,902	1,620,000	($930,417)		$79,277	$300,000	$514,208	$405,000	($207,118)	($59,365)	$138,517			
18	2020	$337,579	1,890,000	($1,155,417)		$84,704	$300,000	$687,458	$472,500	($225,000)	($74,250)	$173,250			
19	2021	$510,631	2,175,000	($1,395,417)		$90,131	$300,000	$900,083	$543,750	($240,000)	($91,125)	$212,625			
21															
22			Total Assets				Total Liab& Equity								
23			$1,290,214				$1,290,214								

Figure 8 (Financial Statement Depreciation Workbook: Scenario 3 Graph)

	A	B	C	D	E
1	Year	Annual Income Recognized	Year-end Retained Earnings	Year-end Current Assets	Year-end Def. Tax Liability
2	2012	$16,771	$16,771	$186,394	$6,081
3	2013	$25,740	$42,510	$102,816	$19,785
4	2014	$36,138	$78,648	$45,693	$34,399
5	2015	$45,165	$123,813	$16,309	$46,871
6	2016	$61,396	$185,208	$15,214	$57,089
7	2017	$82,469	$267,677	$44,775	$65,744
8	2018	$108,014	$375,691	$106,996	$73,006
9	2019	$138,517	$514,208	$203,902	$79,277
10	2020	$173,250	$687,458	$337,579	$84,704
11	2021	$212,625	$900,083	$510,631	$90,131

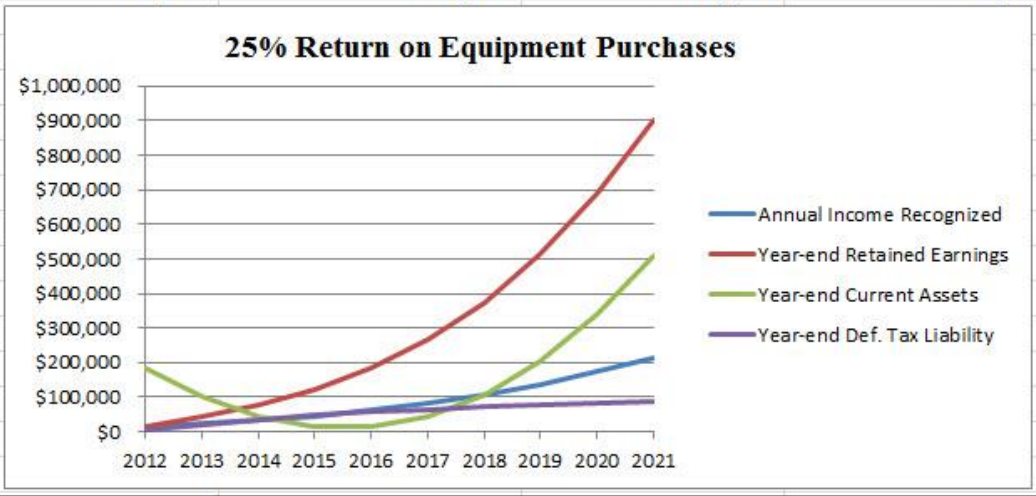

Figure 9 (Financial Statement Prepaid Income Workbook: Scenario 3)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**Scenario Three - Prepaid Income**													
2	**Financial Statements**													
3					2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
4		Warranty Receipts			$150,000	$165,000	$180,000	$195,000	$210,000	$225,000	$240,000	$255,000	$270,000	$285,000
5														
6													Warranty	
7		Current			Unearned			Warranty	Warranty		Net		Expense %	
8		Assets	Def. Tax	=	Revenue	PIC	RE	Revenue	Expense	Tax Exp.	Income		of Revenue	
9	Beg.	$300,000				$300,000								
10	2012	$428,500	$0		$125,000	$300,000	$3,500	$25,000	($20,000)	($1,500)	$3,500		80%	
11	2013	$504,350	$22,500		$212,500	$300,000	$14,350	$77,500	($62,000)	($4,650)	$10,850			
12	2014	$558,500	$32,250		$257,500	$300,000	$33,250	$135,000	($108,000)	($8,100)	$18,900			
13	2015	$602,150	$35,250		$280,000	$300,000	$57,400	$172,500	($138,000)	($10,350)	$24,150			
14	2016	$647,900	$38,250		$302,500	$300,000	$83,650	$187,500	($150,000)	($11,250)	$26,250			
15	2017	$695,750	$41,250		$325,000	$300,000	$112,000	$202,500	($162,000)	($12,150)	$28,350			
16	2018	$745,700	$44,250		$347,500	$300,000	$142,450	$217,500	($174,000)	($13,050)	$30,450			
17	2019	$797,750	$47,250		$370,000	$300,000	$175,000	$232,500	($186,000)	($13,950)	$32,550			
18	2020	$851,900	$50,250		$392,500	$300,000	$209,650	$247,500	($198,000)	($14,850)	$34,650			
19	2021	$908,150	$53,250		$415,000	$300,000	$246,400	$262,500	($210,000)	($15,750)	$36,750			
21														
22			Total Assets				Total Liab& Equity							
23			$961,400				$961,400							

Figure 10 (Financial Statement Prepaid Income Workbook: Scenario 3 Graph)

	A	B	C	D	E
1	Year	Annual Income Recognized	Year-end Retained Earnings	Year-end Current Assets	Year-end Def. Tax Asset
2	2012	$3,500	$3,500	$428,500	$0
3	2013	$10,850	$14,350	$504,350	$22,500
4	2014	$18,900	$33,250	$558,500	$32,250
5	2015	$24,150	$57,400	$602,150	$35,250
6	2016	$26,250	$83,650	$647,900	$38,250
7	2017	$28,350	$112,000	$695,750	$41,250
8	2018	$30,450	$142,450	$745,700	$44,250
9	2019	$32,550	$175,000	$797,750	$47,250
10	2020	$34,650	$209,650	$851,900	$50,250
11	2021	$36,750	$246,400	$908,150	$53,250