

DEPRECIATION'S EFFECT ON CAPITAL BUDGETING METRICS NEEDS MORE EDUCATOR FOCUS

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ABSTRACT

Numerous studies have examined the perceived weakness of newly hired accountants' analytical skills related to capital budgeting activities. This study extends that research by focusing on identifying the cash tax benefits of noncash expense allocations such as depreciation, depletion and amortization, often referred to as "capital recovery" or "tax shield". These benefits significantly affect the NPVs and IRRs of long-lived assets, especially when government tax incentives are provided to spur investment. In this paper, we examine 315 MSA students' understanding of how depreciation expense reflected on the financial statements provides a capital recovery/tax shield. Students received a balance sheet, income statement and a statement of cash flows to review, in addition to case specifics regarding the construction of an apartment building. The two versions of our statements reflected direct and indirect formats of the statement of cash flows. We asked the students whether, in the end, the building was a good investment. We find that very few MSA students (6%) correctly calculated the capital recovery/tax shield provided by the investment. Further, we found that the format of the statement of cash flows did not affect students' accuracy, but did significantly change the incorrect answer given. This is an important finding, since students trained in accounting should not be influenced by the method of reporting for the statement of cash flows. Our finding indicates that in addition to being ill-prepared to address the effects of non-cash items, they are significantly influenced by the reporting method used for the statement of cash flows. Additional research should be conducted on the influence presentation method has on the accounting students' use of the statement of cash flows for budgeting decisions. Limitations include our use of financial statements to determine students' ability to identify the capital recovery/tax shield from a capital project. Usually these projects are evaluated using net incomes and adjustments for capital recovery/tax shields to develop cash flows for NPV, IRR or other metrics. In addition, the calculation of capital recovery/tax shields is only part of the capital budgeting activities of a firm.

Keywords: Full (life)-cycle accounting, Capital budgeting, Net present value, Internal rate of return, Capital recovery, Tax shield.

Introduction

Surveys and discussions with CEOs, CFOs, and other business leaders have verified that there is a common perception that accountants are better trained for successful careers in public accounting than for successful careers inside the corporate environment (Siegel and Sorensen, 2010). Since 90% of accounting professionals operate in the corporate environment, corporations make the business case that cost cutting activities and global competitive pressures make it important that accountants come just as prepared with analytical skills as they are prepared with financial statement accounting skills. In particular, a joint research project with the Institute of Management Accountants and the Financial Executive Institute identified the lack of capital budgeting skills as the biggest need for improvement by newly hired accountants (Siegel and Sorensen, 1994). Allen and Idlebird (2012) provided empirical evidence that non-accounting major students in a MBA program outperformed accounting major students in a Master of Science in Accounting (MSA) program on a routine capital budgeting project. The MBA students more often correctly identified the cash flow time-lines and the need for NPV and IRR techniques. In this paper we provide empirical evidence that MSA students need to better understand the significant economic effect that depreciation expense, reflected on the financial statements, has on long-lived capital budgeting projects. This understanding is necessary to calculate the related capital recovery/tax shields that provide substantial positive benefits to the Net Present Values (NPVs), Internal Rates of Returns (IRRs) and Payback Periods, all metrics commonly used in capital budgeting activities.

Let's consider a real-world example of a Fortune 5's real estate division, who was planning to build two office buildings for \$80 million dollars in 1984. At the time of planning, the IRS allowed office buildings to be depreciated over 19 years using the 175% declining balance method. Therefore, the first year capital recovery/tax shield was projected to be \$2.9 million ($\$80 \text{ million} / 19 \text{ years} * 1.75 * 40\%$ state and federal tax rate). The total projected capital recovery/tax shields added \$14.9 million NPV to the project's economics using the firm's discount rate of 12%. By the time the project was completed, the Tax Reform Act of 1986 extended the depreciation period to 31.5 years using the straight-line method (IRS Publication 946, 2013). The project did not qualify to be grandfathered in at 19 years, so the annual capital recovery/tax shield was reduced to \$1.0 million ($\$80 \text{ million} / 31.5 \text{ years} * 40\%$ tax rate), adding only \$8.3 million to the NPV of the project, an NPV reduction of \$6.6 million (MLDC, 1992).

A further benefit of capital recovery for office buildings is related to the trend for commercial office buildings to appreciate over extended time periods. They are generally found to appreciate in value at least with inflation rates (Pyhrr, Roulac & Born, 1999). Although gains from the sale of the office building are recaptured by IRS and taxed (at a lower rate) as ordinary income, for the investor, the economic effect of reduced tax payments during the holding period is tantamount to an interest-free loan. Similar favorable government tax policies are found in other industries. Depletion allowances can be seen in the oil drilling, mineral and timber industries where "percentage depletion allowances" for independent drillers and "cost

depletion” for major drillers improve the NPVs of the industries’ projects (IRS Publication 535, Business Expenses 2012).

Prior to this study, we collected non-empirical surveys that overwhelmingly demonstrated that MSA students could not correctly calculate the capital recovery/tax shield effect of depreciation when presented with the income statement and the indirect statement of cash flows (Allen and Idlebird, 2012). The indirect format is used by 95% to 98% of public firms (AICPA 1998, 2004). The MSA students most often provided an answer that is equivalent to stating that the depreciation deductions have no capital recovery/tax shield effect or they provided an answer that is equivalent to stating that the depreciation deduction reflected on the income statement is the capital recovery/tax shield; very few students multiplied the depreciation deduction by the tax rate to arrive at the correct capital recovery/tax shield.

As a possible reason for MSA students’ inability to correctly calculate the depreciation expense related capital recovery/tax shield from the financial statements, we examined whether the indirect format of the statement of cash flows, where income statement depreciation is added to after-tax net income, is a possible reason for the MSA students’ miscalculation of capital recovery/tax shield. We empirically tested two groups of students. One group was given the indirect format and the other group was given the direct format statement of cash flows. All MSA students taking Advanced Managerial Accounting for the period fall 2008 through summer 2010 were included in the study. The direct statement of cash flows does not include depreciation expense information. We expected that students given the direct format would use the depreciation expense from the income statement to calculate the tax benefits and not be influenced by the depreciation add-back procedure of the indirect format. We found that a lower percentage of “direct format” students selected the depreciation deduction as the capital recovery/tax shield, but a larger percentage of these students arrived at an answer equivalent to stating that depreciation expense on the income statement has no effect on capital recovery/tax shield. Details of the empirical tests are discussed in the methodology section.

Literature Review

The Changing Environment Committee of the American Accounting Association (AAA, 1998) issued a report recommending that business schools prepare accounting students to have skills and knowledge of both GAAP and non-GAAP financial measures. They report that...companies are looking for analysts, someone who can help make sense of accounting numbers, not just produce the accounting numbers. The Accounting Education Change Commission (AECC, 1999) of AAA reported that the increasing changes in rules, regulations, and accounting complexities resulted in accounting programs having less time to teach the conceptual application of the accounting rules.

Among the studies and surveys performed that discuss the perceived weakness of newly hired accountants’ analytical skills related to capital budgeting activities is a joint research project

with the Institute of Management Accountants and the Financial Executive Institute. This project identified the lack of capital budgeting skills as the biggest need for improvement by newly hired accountants (Siegel and Sorensen, 1994). Allen and Idlebird (2012) provided empirical evidence that non-accounting MBA students outperformed accounting MSA students on a typical capital budgeting exercise. MBA students demonstrated more skills in identifying cash flow time-lines and identifying when Net Present Value (NPV) and Internal Rate of Return (IRR) metrics were more appropriate for economic analysis than Return on Assets (ROA) or Return on Investment (ROI), two metrics that use GAAP accounting results.

Albrecht and Sack (2000) under the auspices of the AAA, AICPA, and the IMA surveyed accounting educators and practitioners. Their survey indicated that only about 6% of them would get a Master of Accounting degree if they could start their college careers over. These educators and practitioners indicated that they would seek a Master in Information Systems or an MBA if they could start their college careers over. This result indicates that practitioners, 90% of whom do not work in public accounting, would broaden their skills rather than concentrate in Master level accounting.

In the CFO journal (2008), a practitioner journal for CFOs, McCann finds that major CFO recruiting firms indicated that the pendulum that swung to CPAs for CFO hires during the Sarbanes-Oxley implementation, is swinging back to MBAs with broader education and finance perspectives in 2007 and early 2008.

Bob Hurt (2007) suggests an accounting curriculum that would include courses on essential skills, including critical thinking. He states, "The development of critical thinking skills is of primary importance for future accountants." Recent research has verified this sentiment. According to Kavanaugh and Drennan (2008), employers are expecting graduates entering the accounting profession to have as the top three skills analytical/problem solving skills, a level of business awareness or real life experience and basic accounting skills. In fact, Hunton (2002) argues that many traditional accounting tasks can be reliably automated, supporting claims that an accountant's value is now increasingly reflected in higher-order skills, such as critical thinking, problem-solving and analytical skills.

This study adds to the literature by providing empirical evidence that newly hired accounting employees need more exposure to critical thinking skills related to understanding the concept of capital recovery/tax shield generated by depreciation. Understanding capital recovery/tax shields is a must have skill for capital budgeting project economics.

Methodology

Case Study Review

The hypothetical case, ABC Company (See Appendix 1 and 1A) was used for the empirical test in Allen and Idlebird (2012). The case involves full (life)-cycle accounting. Full cycle accounting

refers to accounting for a project from the time the first dollar is spent until the project is sold and all cash transactions have been completed. Data provided in the case indicate that all cash transactions occur at year-end, except the original asset purchase date that occurs on the first day of 1997. The two-year period (for cash discounting purposes) between the cash expenditure for the asset date (January 1, 1997) and the net receipt of operating cash (December 31, 1998) is not readily apparent from the financial statements. The case also includes a sale of the asset on the first day of 2001, making the period between the operating cash flows in year 2000 (December 31, 2000) and year 2001 (January 1, 2001) equal to one day, also not apparent from the financial statements. They then compared whether non-accounting MBA students outperformed Accounting MSA students in identifying the cash flow time-lines and the need for NPV and IRR metrics. The MBA students significantly outperformed the MSA students. Since the data given for the ABC case are generally the same (excepting balance sheets) as the data used for project analysis in capital budgeting activities, that study provided empirical evidence that the preparation gap described earlier exists.

Prior to our empirical testing, we used ABC, Appendix 1 and 1A to informally collect data (carried out over 5 years) indicating that MSA students had trouble identifying the capital recovery/tax shield effects of depreciation from the financial statements. We used the indirect format of the Statement of Cash flows (Appendix 1A) during that period. We asked "*how much did the depreciation expense affect cash flows in 1998*" without specifically mentioning the \$50,000 of depreciation nor the \$175,000 cash flow. We theorized that students incorrectly choosing \$50,000 as the capital recovery/tax shield were influenced by the indirect format's use of net income from the income statement totaling \$125,000 added to depreciation expense from the income statement totaling \$50,000 equaling the net cash flow of \$175,000. We further theorized that students selecting \$0 as the capital recovery/tax shield were anchoring to rote memory that "depreciation is a noncash expense and does not affect cash," ignoring the tax savings generated. The rare student correctly calculating the \$25,000 ($\$50,000 \text{ depreciation expense} * 50\% \text{ tax rate}$) capital recovery/tax shield are possibly more prepared for the capital recovery/tax shield aspect of capital budgeting activities.

Because we received so many incorrect responses of \$50,000 or \$0, and rarely a correct response of \$25,000 during our pre-test surveys, we decided to empirically examine whether the indirect format of the statement of cash flows, used by 95% to 98% of firms (AICPA 2004) contributes to the miscalculation of capital recovery/tax shields. As mentioned earlier, the indirect method reflects income statement depreciation added back to net income. Conversely, the direct method does not reflect any depreciation data which should require the student to look at the income statement to determine the depreciation deduction and calculate the capital recovery/tax shield.

The Empirical Test

For this study, we added more specificity to the test question. We asked the following question, "Using ABC's Income Statement and Statement of Cash Flows for 1998, we can determine that net income after-tax was \$125,000 and net cash flow was \$175,000. How much did the \$50,000 depreciation expense affect ABC's net cash inflow of \$175,000? We purposely avoided asking the question using the terms capital recovery or tax shield because, by definition, they should recognize on their own that the \$175,000 of cash flow from operations includes the capital recovery/ tax shield; knowledge that is critical for capital project analysis. Students familiar with capital recovery/tax shield calculations will correctly multiply the \$50,000 depreciation deductions by the 50% tax rate and arrive at \$25,000 as the capital recovery/tax shield. A second procedure they could use is to compare ABC's cash results with another company with the same revenues and expenses except no depreciation as follows:

	ABC	Nodepr.
Revenues	500,000	500,000
Operating Expenses	(200,000)	(200,000)
Depreciation	(50,000)	0
Net Income-before-tax	250,000	300,000
Tax (50%)	(125,000)	(150,000)
Net Income after-tax	125,000	150,000
ABC cash = 500,000 -200,000 -125,000 = 175,000		
Nodepr. cash = 500,000 -200,000-150,000 = 150,000		

The difference in tax payments is \$25,000

The MSA students were divided into two groups by class sections. The first group consisting of 144 students was given the ABC case, Appendix 1 and 1A (indirect method) and asked to calculate the effect of the \$50,000 depreciation total on the \$175,000 cash flow. The second group, consisting of 171 students, was given Appendix 1 and Appendix 1B (direct format). Since there are no book to tax adjustments, students can assume that financial and tax books are the same. In addition, since there are no other non-cash expenses than depreciation, they should be able to focus on depreciation's effect on cash flows which is \$25,000 (\$50,000*50% tax rate)-the capital recovery/tax shield.

Based on our pre-empirical testing data collection, we expected only three answers to be given; either (1) \$50,000 the depreciation deduction reflected on the income statement and added back to net-income on the statement of cash flows; 2) \$0 due to their rote understanding that depreciation does not affect cash, forgetting about the tax benefit; or 3) \$25,000 because they understand how to calculate capital recovery/tax shield. Our hypothesis stated in the alternative is:

H1: More students will correctly identify the \$25,000 capital recovery/tax shield using the direct cash flow method.

Our hypothesis was based on the assumption that students previously answering \$50,000 on our surveys were influenced by the indirect statement of cash flows' add-back of depreciation procedure; the students anchored on the depreciation expense add-back as the capital recovery/ tax shield. For students previously answering \$0, our theory was that these students have anchored on the statement found in many accounting text books; that depreciation is a noncash expense and does not affect cash. Because the direct format of the statement of cash flows does not reflect any depreciation expense information, we expected that direct format subjects will go to the income statement and assign the 50% tax rate to the depreciation, arriving at \$25,000 as their response.

Demographics of Test Subjects

The study included all 315 MSA students attending advanced managerial accounting classes at a southeastern university. As mentioned in the introduction, all MSA students enrolled in Advanced Managerial Accounting for the period fall 2008 through summer 2010 were included in the study. The decision on which class would get the direct or indirect format was based on balancing the group sizes as much as possible. The MSA students attended 38 different universities for their undergraduate degrees. The majority of the students were completing the 150 hour requirement to sit for the CPA exam. Although they all majored in accounting as undergraduates, their concentrations are in Audit, Tax and to a lesser extent Managerial Accounting. The students generally have less than two years of actual professional work experience. They estimated that they spent a mean (median) of 7.7 (5) classroom hours on cash flow related topics during their undergraduate studies.

Results

As expected, in Table 1, the observed frequencies panel (top left) shows that 308 of the 315 students answered, \$50,000, \$25,000 or \$0. Seven students (4 indirect and 3 direct) answered with some other number and were excluded from the results since their answers were illogical and would not affect the nonparametric Chi sq. test. Our final sample consisted of 140 students using the indirect statement of cash flows format (appendix 1A) and 168 students using the direct statement of cash flows (Appendix 1B); only 19 of the 308 students correctly identified the correct cash effect. As reflected in the observed frequency (%) panel (top right), the format of the statement of cash flow did not result in a percentage increase of students giving the correct answer- -only 6% identified the correct answer of \$25,000, respectively. Our hypothesis that more of the direct format students would select the correct answer is rejected. We theorize that the switch from \$50,000 to \$0 by the direct format students was caused by more students anchoring on the incorrect adage that depreciation is a noncash expense, since they were not presented the add-back procedure of the indirect format.

Table 1.

<u>Observed Frequencies</u>				<u>Observed Frequencies %</u>			
<u>Answers</u>	<u>Indirect</u>	<u>Direct</u>	<u>Total</u>	<u>Answers</u>	<u>Indirect</u>	<u>Direct</u>	<u>Total</u>
50,000	59	28	87	50,000	42%	17%	28%
\$0	73	129	202	\$0	52%	77%	66%
\$25,000	8	11	19	\$25,000	6%	6%	6%
Total	140	168	308	100%	100%	100%	100%

<u>Expected Chi Sq. Frequencies</u>			
<u>Answers</u>	<u>Indirect</u>	<u>Direct</u>	<u>Total</u>
50,000	39.6	47.4	87
\$0	91.8	110.2	202
\$25,000	8.6	10.4	19
Total	140.0	168.0	308

Note: $\chi^2 = 24.9$, significant at $< .005$

The expected Chi. sq. Frequencies panel (bottom left) shows the expected frequencies using the nonparametric Chi sq. Test of Independence. The chi sq. statistic of 24.9 was significant at $< .005$, meaning that the cash flow format had a statistically significant effect on the answer chosen; in this case the incorrect answer chosen.

Conclusion

Findings in this study indicate that the MSA students need a better understanding of how noncash allocations such as depreciation expenses (depletion and amortization) generates capital recovery/tax shield which can have a significant effect on project NPV and IRR, important metrics used in capital budgeting activities. In addition, MSA students need to understand that for long-lived assets like office buildings, the depreciation expense deduction “is not” just another tax deduction like all other expense deductions. Most other expenses are from cash spent in recent time periods, depreciation expense on the income statement can reflect cash spent up to 39 years prior, requiring time value of money techniques at the project level.

A possible explanation for the underperformance by MSA students calculating capital recovery/tax shield could be the emphasis place on depreciation expense in the classroom. In Table 2, five accounting texts were selected at random and some of their discussions of depreciation deductions are excerpted. These accounting texts seem to emphasize that the depreciation deduction does not affect cash flows. Little if any emphasis is placed on the capital recovery/tax shield effects of depreciation deductions. Presenting life cycle accounting cases like ABC company, Appendix 1, 1A and 1B, could expand the accounting students’ understanding of project analysis. In particular, it would help them understand how cash flow time-lines are developed, how the benefits of capital recovery/tax shield affect project analysis and recognize

when GAAP accounting's accrual requirements make NPV and IRR techniques more appropriate for project analysis.

Table 2.

Sample of Excerpts from Accounting Texts

...depreciation is not a source of cash. Some people argue that depreciation is a source of cash because depreciation expense reduces taxable income and hence reduces cash outflow in payment of taxes. The cash transaction is the income tax payment, and depreciation merely enters into the calculation of taxable income and hence reduces the tax payment. Fairway Corp. could increase any expense, such as giving every employee a 25% increase. Would one then say that increased wage expense is a source of cash?...Although depreciation enters into the calculation of (cash flow earnings), depreciation is not itself a source of cash (Anthony, Hawkins, & Merchant, 2011).
The other adjustments to net income (gain, depreciation, loss) as pointed out earlier are to get rid of the three income statement components that have no effect at all on cash (Spiceland, Sepe, & Tomassini, 2007).
This entry shows that depreciation expense has no effect on cash. However, depreciation expense, like all other expenses, is deducted from revenues to compute net income. Therefore, in going from net income to cash flows, we add depreciation back to net income. The add-back cancels the earlier deduction (Harrison and Horngren, 2004).
Would you have more cash if you depreciated your car? The answer is no. Depreciation does not affect your cash flows. Likewise, depreciation does not affect the cash flows of a business. However, depreciation is subtracted in determining net income (Warren, 2011).
A common misconception about depreciation is that it provides funds for the replacement of fixed assets. Depreciation is like any other expense in that it reduces net income. It differs, though, in that it does not involve a current cash outflow (Kieso, Weygandt, & Warfield, 2012).

In Table 3, four Finance and two Real Estate texts were selected at random. These texts place the emphasis of the depreciation deduction on the tax savings aspect of the depreciation deduction, a different emphasis than the accounting texts.

Another possible reason for MSA students' underperformance is when they take their finance course(s) that routinely teach project analysis and evaluation, they fail to integrate that knowledge with GAAP accounting's myriad of regulations.

Since depreciation expense is generally one of the largest items on the indirect cash flow statement, as mentioned earlier, it can have a significant effect on NPV and IRR metrics at the project level. It should be of concern that so few MSA students can correctly calculate the depreciation related capital recovery/tax shield from the financial statements.

Table 3

Excerpts from Finance and Real Estate Texts

Suppose Global had an additional \$1 million depreciation expense in 2009. If Global's tax rate on pretax income is 26%...Depreciation is an operating expense, so Global's operating income, EBIT, and pretax income would fall by \$1 million. This decrease in pretax income would reduce Global's tax bill by $26\% \times \$1 \text{ million} = \0.26 million . Therefore, net income would fall by \$0.74 million, but we would add back the additional depreciation of \$1 million because it is not a cash expense. Thus, cash from operating activities would rise by $-0.74 + 1 = \$0.26 \text{ million}$. Thus, Global's cash balance at the end of the year would increase by \$0.26 million, the amount of the tax savings that resulted from the additional depreciation deduction (Berk and Demarzo, 2010).
As we saw earlier in the chapter, higher depreciation expenses results in lower taxes, hence higher cash flows (Weston, Besley, & Brigham, 1996).
Depreciation shelters income from taxation, and this has an impact on cash flow, but depreciation itself is not a cash flow (Brigham and Daves, 2004).
If the depreciation expense were not taken, then profits would be overstated and taxes would be too high (Brigham and Ehrhardt, 2011).
Tax depreciation shelters a portion of annual operating income (NOI) from taxation. Thus tax-sheltering ability...reduces the annual tax liability of investors...Consider, for example, the Centre point Building that will generate an annual depreciation deduction of \$18,154. This deduction shelters $\$18,154 \times 30\%$ the 30% tax rate, thereby saving the taxpayer \$5,446 in taxes each year (Ling and Archer, 2006).
...investors can reduce taxable income each year by the amount of depreciation deductions (*tax rate) even though the property is not really depreciating in value...the reduced basis will result in an increase in taxes paid in the year of sale...the time value of money makes the lower annual tax payments a benefit to the investor (Brueggeman and Fisher, 2008).

Limitations

Findings from this study are limited to MSA students' abilities at a southeastern university to determine the capital recovery/tax shield from a set of financial statements. Capital budget projects are usually presented with net incomes and adjustments for capital recovery/tax shields to develop cash flows for NPV, IRR or other metrics. The balance sheet completing the full cycle is not normally part of the data presented. The presentation of this additional information could have affected the results. In addition, the calculation of capital recovery/tax shields does not represent all the capital budgeting activities of a firm. The criticism of newly hired accountants' capital budgeting skills by CFOs and CEOs did not highlight that the individual capital budgeting activity, specifically, was where improved skills are needed.

In addition to the instruments used, all subjects coming from one University's graduate school presents an additional limitation. Different results may have come from this study being performed at another University. In addition to the instrument used, another possible limitation

is that some other graduate schools could have older students with more experience in capital budgeting activities. However, this limitation is mitigated by the surveys and studies that support our findings (Siegel and Sorensen, 2010). Further, the test question of *the effect of the \$50,000 depreciation on the \$175,000 cash flow* could have been misinterpreted by subjects. If they looked at the depreciation deduction on the income statement as separate from the related tax deduction as suggested by some accounting texts, then \$0 could be an answer. However, this theory would not explain the significant increase (52% to 77%) of subjects selecting \$0 when presented with the direct method; this increase came from the percentage of subjects previously selecting \$50,000 as the capital recovery/tax shield (Table 1) when presented with the indirect format.

Finally, this study is not recommending a change to the direct format of the statement of cash flows recommended by the Financial Accounting Standards Board as promulgated in Financial Accounting Standard No. 95. Numerous studies have reported on the reconciliation problems using the change in balance sheet accounts to prepare the statement of cash flows (Bahnsen, Miller, and Budge (1996). The reconciliation problem, referred to as “nonarticulation” is beyond the scope of this paper. Instead, we are suggesting that accounting educators should emphasize to publishers that attempts need to be made to include discussion on the importance of non-cash items on capital recovery/tax shields in textbooks. In addition, educators should be aware of the inadequacies of many texts, and intentionally include discussion regarding this issue in courses where long-lived capital asset budgeting is discussed.

Appendix 1

Background Information and Financial Statements - ABC Company - Full Cycle Accounting

1997 - January 1, 1997 investors deposited \$1 million of equity in ABC. The funds were used the same day to pay \$1 million for construction of an apartment building. The investors knew that it would take a year to complete the building and get leases signed.

1998 - January 1, 1998 ABC has fully rented apartment building. All rent receipts and expense payments are made at the end of the current year. Annual rent receipts are \$.5 million and expenses (ex-depreciation) are \$.2 million. Taxes are paid at the end of the current year. The building is being depreciated over 20 years (straight-line and no salvage value) for financial and tax accounting. Note that net income is \$.125 million and net cash inflow is \$.175 million.

1999 - No change in level of operation. Note that net income is \$.125 million and net cash inflow is \$.175 million for the year.

2000 - No change in level of operation. Note that net income is \$.125 million and net cash inflow is \$.175 million for the year.

2001 - On January 1, ABC sells the building for \$.850 million cash. Since the net book value of the building is also \$.850 million, there is no “gain or loss from sale” to be recognized.

Note that after the building is sold, the final accounting shows the cash account to be \$1.375 million or \$.375 million greater than the initial investment. Also note that total net income over the time that ABC held the building is also \$.375 million. Net cash flow and Net Income will always be equal over the full-cycle (sometimes referred to as life-cycle) accounting period. They will rarely, if ever, be equal on a year-by-year basis. Question: Was the apartment a “good” purchase for ABC?

Appendix 1A

(000)	Balance sheets				
	1997	1998	1999	2000	2001
Assets:					
Cash	0	175	350	525	1,375
Apartment	1,000	950	900	850	0
Total Assets	<u>1,000</u>	<u>1,125</u>	<u>1,250</u>	<u>1,375</u>	<u>1,375</u>
Liabilities:	0	0	0	0	0
Shareholders' Equity:					
Equity	1,000	1,000	1,000	1,000	1,000
Retained Earnings	0	125	250	375	375
Total Equity	<u>1,000</u>	<u>1,125</u>	<u>1,250</u>	<u>1,375</u>	<u>1,375</u>
Liabilities and Equity	<u>1,000</u>	<u>1,125</u>	<u>1,250</u>	<u>1,375</u>	<u>1,375</u>
	Income Statements				
	1997	1998	1999	2000	2001
Revenues	0	500	500	500	0
Operating expenses	0	(200)	(200)	(200)	0
Depreciation	0	(50)	(50)	(50)	0
Gross Profits	<u>0</u>	<u>250</u>	<u>250</u>	<u>250</u>	<u>0</u>
Income Taxes (50%)	0	(125)	(125)	(125)	0
Net Income	<u>0</u>	<u>125</u>	<u>125</u>	<u>125</u>	<u>0</u>
	Indirect Cash Statements				
	1997	1998	1999	2000	2001
Net Income After-Tax	0	1	125	125	0
Add back: depreciation	0	50	50	50	0
Net cash Flow	<u>0</u>	<u>175</u>	<u>175</u>	<u>175</u>	<u>850</u>

Appendix 1B

(000)		Balance sheets				
		1997	1998	1999	2000	2001
ASSETS						
	Cash	0	175	350	525	1,375
	Apartment	1,000	950	900	850	0
	Total Assets	<u>1,000</u>	<u>1,125</u>	<u>1,250</u>	<u>1,375</u>	<u>1,375</u>
Liabilities		0	0	0	0	0
Shareholders' Equity						
	Equity	1,000	1,000	1,000	1,000	1,000
	Retained Earnings	0	125	250	375	375
	Total Equity	<u>1,000</u>	<u>1,125</u>	<u>1,250</u>	<u>1,375</u>	<u>1,375</u>
Liabilities and Equity		<u>1,000</u>	<u>1,125</u>	<u>1,250</u>	<u>1,375</u>	<u>1,375</u>
		Income Statements				
		1997	1998	1999	2000	2001
	Revenues	0	500	500	500	0
	Operating expenses	0	(200)	(200)	(200)	0
	Depreciation	0	(50)	(50)	(50)	0
	Gross Profits	<u>0</u>	<u>250</u>	<u>250</u>	<u>250</u>	<u>0</u>
	Income Taxes (50%)	0	(125)	(125)	(125)	0
	Net Income	<u>0</u>	<u>125</u>	<u>125</u>	<u>125</u>	<u>0</u>
		Direct Cash Statements				
		1997	1998	1999	2000	2001
	Cash from revenues	0	500	500	500	0
	Cash paid for expenses	0	(200)	(200)	(200)	0
	Cash paid for taxes		(125)	(125)	(125)	
	Investment in firm	1,000				
	Sale/(Buy) Apartment	(1,000)				850
	Net cash Flow	<u>0</u>	<u>175</u>	<u>175</u>	<u>175</u>	<u>850</u>

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