

Capital Budgeting – Final Analysis

For 9.220 Students, Term 1, 2002/03
02_Lecture11.ppt

Lecture Outline

- Introduction
 - CCA Detailed Calculations
 - Capital Gains Taxes
 - Summary of Capital Budgeting Items and Tax Effects
 - Corporate Strategy and Qualitative Checks
 - Summary and Conclusions
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Introduction

- To continue determining the after-tax cash flows to be used for a capital budgeting analysis, we must thoroughly understand the implications of asset purchases and sales, when expenses are recognized and taxes are reduced, and when gains occur and taxes are increased.
 - In this lecture, we will examine CCA deductions and CCA tax shields. In addition we will examine asset sales, CCA adjustments and capital gains taxes.
 - We will utilize a simplifying assumption that the corporation will always own some assets of the type we include in our project. Further refinement of that assumption (asset pool termination, p. 220) is left for more advanced courses.
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Detailed CCA Calculations

- See handout, "Notes on Real-World Capital Budgeting", pages 1 and 2.
 - Example: DuoCity Taxi is considering expanding its fleet.
 - The cost of the new taxis is \$1,000,000 now.
 - Taxis fall under CCA Class 16 and are allowed a CCA rate of 40%.
 - DuoCity's tax rate is 45% and the relevant opportunity cost of capital is 15%.
 - The project will generate revenues in excess of expenditures of \$450,000 per year for 5 years.
 - The project will also require an immediate working capital increase of \$50,000, no intermediate changes, and a reversion to normal working capital requirements at the end of 5 years.
 - Assume the taxis relevant to this project will be sold at the beginning of the 6th year for \$100,000.
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Analysis using Total Project Cash Flows:
the net of yearly **after-tax** cash flows.

Item	Year 0	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5
Asset Purchase/sale	-\$1,000,000	\$0	\$0	\$0	\$0	+\$100,000
CCA tax shield	\$0					
Net Revenue less Expense	\$0					
Working Capital	-\$50,000	\$0	\$0	\$0	\$0	
Net	-\$1,050,000					

NPV = _____

Analysis using the Tax-Shield Approach:
keep CCA tax shield effects separate in the analysis

Item	Year 0	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5
Asset Purchase/sale	-\$1,000,000	\$0	\$0	\$0	\$0	+\$100,000
Net Revenue less Expense	\$0					
Working Capital	-\$50,000	\$0	\$0	\$0	\$0	
Net	-\$1,050,000					

NPV of above cash flows =

PV of CCA tax shields =

NPV of the project = _____

Capital Gains Tax

- See page 3 of the handout.
 - Redo the CCA tax shield analysis assuming the taxis were sold for...
 - \$500,000
 - The UCC balance drops by \$500,000 and (for these taxis) falls negative, however assuming the overall UCC for class 16 is positive, this just causes fewer CCA deductions and tax shields in the future.
 - \$1,200,000
 - The UCC balance drops by \$1,000,000 due to the asset sale; this is the value used for S_n .
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Summary of Capital Budgeting Items and Tax Effects

- The following formula may help summarize the project's NPV calculation.

NPV = -initial asset cost¹

$$\begin{aligned} &+ PV_{\text{Salvage Value or Expected Asset Sale Amount}}^1 \\ &+ PV_{\text{incremental cash flows caused by the project}}^2 \\ &+ PV_{\text{incremental working capital cash flows caused by the project}}^1 \\ &- PV_{\text{Capital Gains Tax}}^3 \\ &+ PV_{\text{CCA Tax Shields}} \end{aligned}$$

Footnotes:

1. These items usually have the same before-tax amounts and after-tax amounts. I.e., there is no tax effect. For asset purchases/sales the tax effect is done through CCA effects.
 2. These items usually have the after-tax cash flow equal to the before tax cash flow multiplied by $(1-T_c)$.
 3. Capital gains tax is only triggered when the asset is sold for an amount greater than its initial cost.
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Qualitative Checks (Ch. 8.1)

- A gut feeling or a hunch does not make a good project.
 - Number crunching alone does not make a good project either.
 - However, the combination of qualitative analysis from corporate strategy with a careful numerical analysis results in the best mix of inputs for good decision making.
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Qualitative checks (continued)

- Remember, a positive NPV indicates wealth is being created. This is equivalent to the economic concept of "positive economic profit".
 - When does positive economic profit occur?
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Competitive Advantage and Positive NPV

- Only if there are sources of competitive advantage, should a positive NPV result.
 - The qualitative analysis of competitive advantage and the quantitative NPV analysis therefore act to complement each other. Combined, they lead to better decisions.
 - The stock market recognizes such good decisions by rewarding new projects that utilize or enhance competitive advantages and generate positive NPV's.
 - Stock prices typically rise on the announcement of a previously unanticipated project that enhances the corporation's strategy and generates positive NPV.
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Summary and Conclusions

- A careful analysis of all relevant cash flows for a project must be done. Tax aspects of the analysis can prove quite challenging, however, projecting distant future cash flows may also be quite difficult.
 - A careful NPV (or IRR or PI) analysis will show which projects will add wealth to the firm. This should be confirmed with an equally careful analysis of the corporate strategy to ensure that the positive NPV result can be shown to be the result of some form of competitive advantage.
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