

Relevant Capital Budgeting Cash Flows are **Future, Operating, Incremental, After-tax, Cash Flows**

Initial Cash Flows:

1. Cost of new equipment including shipping and installation (this is the number that will be depreciated (depreciable basis)), always a cash outflow (-).
2. Change in working capital (increases in assets are a use (-) of cash, increases in liabilities are a source (+) of cash).
3. Tax impact of new equipment (not tested in MBA 8622).
Replacement only, 4. Salvage Value of Old Equipment, always a cash inflow (+).
Replacement only, 5 Tax impact of Old Equipment (= ((Book Value – Salvage Value)*tax rate)), may be inflow or outflow.

Operating Cash Flows, a modified income statement for each year of the Project

$$\begin{aligned} \text{Change in} & \quad + \text{ Sales} \\ & \quad - \text{ Variable Operating Expenses} \\ & \quad - \text{ Fixed Operating Expenses} \\ & \quad - \text{ Depreciation (depreciable basis * depreciation percentage)} \\ = & \quad \text{EBIT} \\ & \quad - \text{ Taxes} \\ = & \quad \text{NOPAT} \\ & \quad + \text{ Depreciation} \\ = & \quad \text{Operating Cash Flows} \end{aligned}$$

If a replacement problem, use net changes for Sales, Variable Operating Expenses, Fixed Operating Expenses and Depreciation. For example, in a replacement problem, Depreciation = Depreciation on New Equipment – Depreciation of old Equipment.

Terminal Cash Flows

1. Salvage Value of the now old New Equipment, always a cash inflow.
2. Tax impact of Old Equipment = ((Book Value – Salvage Value) * tax rate). Note, book value = purchase price – accumulated depreciation. If you sell machine for more than book value, this is a profit that creates a tax liability or a cash outflow (-). If you sell the machine for less than book value, this is a loss/reduction in profits that creates a tax credit or a cash inflow (+).
3. Recovery of Working Capital (the exact same number as line 2 in Initial Cash Flows with the opposite sign).
Replacement Problems Only, 4. Opportunity Cost of not receiving Salvage Value for Old equipment, which is always a cash outflow (-). This is because if you sell the old machine at time 0 (a cash inflow) you cannot later sell it at the end of the project. Thus we record the selling price we do not receive as a negative number.
Replacement Problems Only, 5. Opportunity Cost of tax impact of not receiving Salvage Value for Old Equipment = - ((Book Value-Opportunity Salvage)*tax rate). Note the negative sign prior to book value, since line 4 is always a cash outflow, we reverse the sign for the tax impact.

Consider the following Replacement Problem:

Topsider Inc. is considering the purchase of a new leather-cutting machine to replace an existing machine that has a book value of \$3,000 and can be sold for \$1,500. The old machine is being depreciated to \$0 on a straight-line basis. The old machine's estimated salvage value 3 years from now is \$500. The new machine will reduce fixed costs (before taxes) by \$7,000 per year. The new machine will improve quality, thus increasing our leather sales from \$15,000 to \$17,000 per year. Variable Costs are 50% of Sales. The new machine has a 3-year life, it costs \$14,200, and it can be sold for an expected \$2,000 at the end of the third year. Because of the new sales, we will increase our inventory by \$1,000, our accounts receivable by \$1,500, and our accounts payable by \$780. Our tax accountant has told Topsider that the new machine would be depreciated using the following depreciation schedule; Year 1 @ 33%, Year 2 @ 45%, Year 3 @ 15%, and Year 4 @ 7% Assume a 40 percent tax rate and a cost of capital of 16 percent. Typically, you will be asked 3-5 of the below questions on the Final Exam:

1. What is the Initial Cash Flow?
2. What is the Operating Cash Flows in Year 2?
3. What is the Terminal Cash Flow (a.k.a. non-operating) in year 3?
4. What are the total cash flows in Year 3?
5. What is the NPV and/or IRR of the project?

To answer the above questions, first solve the entire problem, then answer the questions.

Initial Cash Flows:

1. Cost of New Equipment = -\$14,200
 2. Change in working Capital = -\$1,720 (=-1000-1500+780)
 3. Tax Impact of New Equipment = 0
 4. Salvage Value of Old Equipment = +\$1,500
 5. Tax Impact of Old Equipment = +600 (=((3000-1500)*40%))
- Total Initial Cash Flows = -\$13,820

Operating Cash Flows Years 1-3

	Year 1	Year 2	Year 3
New Sales	17000	17000	17000
Old Sales	15000	15000	15000
=Net Sales Change	+2000	+2000	+2000
Fixed Costs	+7000	+7000	+7000
Net Variable Costs	-1000	-1000	-1000
New Depreciation	-4686	-6390	-2130
Old Depreciation	+1000	+1000	+1000
=Net Depreciation	-3686	-5390	-1130
=EBIT	+4314	+2610	+6870

-taxes @ 40%	-1725.6	-1044	-2748
=NOPAT	+2588.4	+1566	+4122
+Net Depreciation	+3686	+5390	+1130
=Operating Cash Flow	+6274.40	+6956	+5252

Terminal Cash Flows:

1. Salvage of New Machine = +2000
 2. Tax impact of New Machine = -402.40 = (994 {14200*7% or [14200 – (14200*93%)]} - 2000)*40%)
 3. Reversal of working capital = +1720
 4. Opportunity Cost of old equipment = -500
 5. Tax impact of old machine opportunity costs = +200 = - ((0-500)*40%)
- Terminal Cash Flows = +3017.60

Thus our timeline is

Year	0	1	2	3
Initial	-13820			
Operating		+6274.40	+6956	+5252
Terminal				+3017.60
Totals	-13820	+6274.40	+6956	+8269.60

NPV@16% = \$2056.389356

IRR=24.465734%