

PRINCIPLES OF FINANCE
FIN 3403
Capital Budgeting: Cash Flow Estimation and Risk

- The CFO of Genham Publishing Corporation is evaluating a proposal to purchase a new printing machine that will help the firm to more efficiently produce the magazines it publishes. If the new printer is purchased, it will replace an existing printer. The new printer has a purchase price of \$130,000. In addition, it costs \$8,000 to ship the printer to Genham, and \$3,000 will have to be paid to modify existing facilities to install the printer. Genham expects sales to increase by \$40,000 if it purchases the new printer. Even though sales will increase, raw materials, labor costs, and other operating expenses are not expected to change if the new printer is purchased, because the new machine is more efficient than the existing machine. These estimates were provided by a consultant Genham hired a few months. The consultant was paid \$10,000 to evaluate the new printer and to estimate the effects on operations of replacing the existing printer. The estimated life of the new printer is five years, which is the same as the estimated remaining life of the old printer. In five years, it is estimated that the new printer can be sold for \$20,000 and that the old printer can be sold for \$6,000 if the firm decides not to purchase the new printer. The existing printer, which was purchased two years ago for \$90,000, currently has a market value equal to \$18,000. Both the new printer and the existing printer fall in the MACRS 5-year class for the purposes of determining depreciation. Genham's required rate of return is 15 percent and its marginal tax rate is 35 percent. Should Genham purchase the new printer? Support your answer with computations. Compute both the net present value (NPV) and the internal rate of return (IRR) for the project.

SOLUTION

Initial Investment Outlay:

New printer purchase price	(130,000)
Shipping	(8,000)
Installation	(3,000)
Sale of old printer	18,000
Tax on sale of old printer	<u>8,820*</u>
Initial investment outlay	(114,180)

Book value of old asset = $90,000 - 90,000(0.20 + 0.32) = 43,200$ (The asset is two years old and being depreciated using MACRS 10-year life rates.)

Gain on the sale of the old asset = $\$18,000 - \$43,200 = \$(25,200)$

Tax on the gain = $\$(25,200)(0.35) = \$(8,820)$ This is a negative tax, which is a tax "refund."

Incremental Operating Cash Flows:

	1	2	3	4	5
Δ in sales	40,000	40,000	40,000	40,000	40,000
Δ in depreciation**	(11,100)	(34,320)	(16,890)	(11,520)	(15,510)
Δ in taxable income	28,900	5,680	23,110	28,480	24,490
Δ in taxes (35%)	(10,115)	(1,988)	(8,089)	(9,968)	(8,572)
Supplemental operating CF = Δ in sales + Δ in taxes	29,885	38,012	31,912	30,032	31,428
** Δ Depreciation					
1 2 3 4 5					
New printer ^a	28,200	45,120	26,790	16,920	15,510
Old printer ^b	(17,100)	(10,800)	(9,900)	(5,400)	0
	11,100	34,320	16,890	11,520	15,510

^a New printer depreciation = \$141,000(% depreciated). The % depreciated each year is 0.20, 0.32, 0.19, 0.12, and 0.11 for Years 1-5, respectively.

^b Old printer depreciation = \$90,000(% depreciated). The % depreciated each year is 0.19, 0.12, 0.11, 0.06, and 0.0, respectively. Remember that the old printer is two years old; so the depreciation rates for Years 3-7 are used here.

Terminal Cash Flow:

Salvage of new printer	20,000
Tax on sale of new printer ^d	(4,039)
Salvage of old printer (a CF not received if the new printer is purchased)	(6,000)
Tax on sale of old printer (a CF not paid if the new printer is purchased) ^e	2,100
	12,061

^d Book value of new printer at the end of five years = \$141,000(0.06) = 8,460

Gain on the sale of the new printer = 20,000 – 8,460 = 11,540

Tax on gain = 11,540(0.35) = 4,039

^e Book value of old printer at the end of five years if it still exists = 0 (the printer will be fully depreciated)

Gain on the sale of the old printer if still exists = 6,000 – 0 = 6,000 (this is the amount the firm will lose receive if it replaces the old printer)

Tax on gain = 6,000(.035) = 2,100 (this amount will not have to be paid if the firm replaces the old printer)

$$NPV = -\$114,180 + \frac{\$29,885}{(1.15)^1} + \frac{\$38,012}{(1.15)^2} + \frac{\$31,912}{(1.15)^3} + \frac{\$30,032}{(1.15)^4} + \frac{\$31,428 + \$12,061}{(1.15)^5} = \$325$$

IRR = 15.11%

The project is acceptable, because NPV > 0 and IRR > 15%

2. The CFO of Genham just learned that the new printer that is being evaluated is considered a much riskier investment than its existing, or average, assets. Generally, when projects that

are considered much riskier than the “average” assets are evaluated, Genham adds three percentage points to its required rate of return when computing the NPV. Based on this new information, should Genham purchase the project?

The project would not be acceptable in this case, because the risk-adjusted required rate of return would now be $18\% = 15\% + 3\%$, and the project's IRR is 15.1%