

IE 342
SUPPLEMENTARY FOR THE FINAL EXAM

- 1) Gentry Machines, Inc., has just received a special job order from one of its clients. The following financial data have been collected:
- This two-year project requires the purchase of special-purpose equipment for \$55,000. The equipment falls into the MACRS five-year class.
 - The machine will be sold for \$27,000 (today's dollars) at the end of two years. The project will bring in additional annual revenue of \$114,000 (actual dollars), but it is expected to incur an additional annual operating cost of \$53,800(today's dollars).
 - The project requires an investment in working capital in the amount of \$12,000 at $n=0$. In each subsequent year, additional working capital needs to be provided at the general inflation rate. Any investment in working capital will be recovered after the project is terminated.
 - To purchase the equipment, the firm expects to borrow \$50,000 at 10% over a two-year period. The remaining \$5,000 will be taken from the firm's retained earnings. The firm will make equal annual payments of \$28,810 (actual dollars) to pay off the loan.
 - The firm expects a general inflation of 5% per year during the project period. The firm's marginal tax rate is 40%, and its market interest rate is 18%.

a) Compute the after-tax cash flows in actual dollars.

b) What is the equivalent present value of this amount at time 0?

Answer: a)

	0	1	2
Net Cash Flow (actual)	\$17,000	\$11,496	\$53,110
Net Cash Flow (constant)	\$17,000	\$10,949	\$48,172

b) $PW(18\%) = \$30,885$

$IRR(\%) = 103.59\%$

- 2) Norcross Textile Company is considering automating its piece-goods screen printing system at a cost of \$20,000. The firm expects to phase out the new printing system at the end of five years due to changes in style. At that time, the firm could scrap the system for \$2,000 in today's dollars. The expected net savings due to automation also are in today's dollars (constant dollars) as follows:

End of Year	Cash Flow (in constant \$)
1	\$15,000
2	17,000
3-5	14,000

The system qualifies as a five-year MACRS property and will be depreciated accordingly. The expected average general inflation rate over the next five years is approximately 5% per year. The firm will finance the entire project by borrowing at 10%. The scheduled repayment of the loan will be as follows:

End of Year	Principal Payment	Interest Payment
1	\$6,042	\$2,000
2	6,647	3,396
3	7,311	731

The firm's market interest rate for project evaluation during this inflation-ridden time is 20%. Assume that the net savings and the selling price will be responsive to this average inflation rate. The firm's marginal tax rate is known to be 40%.

- Determine the after-tax cash flows of this project, in actual dollars.
- Determine the net present-value reduction (or gains) in profitability due to inflation

Answer:

- With inflation

	0	1	2	3	4	5
Net Cash Flow (actual)	\$0	\$3,808	\$6,321	\$3,511	\$11,132	\$13,635

$$PW(20\%) = \$20,443$$

- Without inflation

	0	1	2	3	4	5
Net Cash Flow (actual)	\$0	\$3,358	\$5,276	\$2,186	\$9,322	\$10,982

$$PW(14.29\%) = \$19,537$$

Net gains due to financing -\$906