

PROBLEM SET 1

1.- A machine costs \$380,000 and is expected to produce the following cash flows:

Year	1	2	3	4	5	6	7	8	9	10
Cash Flows (000s)	\$50	\$57	\$75	\$80	\$85	\$92	\$92	\$80	\$68	\$50

If the cost of capital is 12 percent, what is the machine's NPV?

2.- Calculate the IRR (or IRRs) for the following project:

C_0	C_1	C_2	C_3
-3000	3500	4000	-4000

For what range of discount rates does the project have positive NPV? Would you invest in it if the hurdle rate is 8%?

3.- Your firm has recently reached an expansion phase and is seeking possible new geographic regions to market the newly patented chemical compound product Ghupto. The five regional projections are as follows:

	0	1	2	3	4	5
Northeast	-95	15	20	25	30	30
Midwest	-75	15	20	20	25	30
Southeast	-60	10	15	20	20	25
West Coast	-35	5	10	10	15	15
Southwest	-20	5	5	6	6	10
Zero-coupon yield		6.5%	7%	7%	7.5%	8%

- a) Which regions would be profitable to the firm? Which of the five is the most profitable?
- b) If current budgeting can support a \$100 million expenditure in year 0, what combination of regions is optimal.
- c) Assume now that you can expand without regional saturation. With the budget constraint in part b, which region is optimal?

4.- Small Corp. is investigating a possible new project X, which would affect corporate cash flow as follows:

Cash Flows of Small Corp without project X

0	1	2	3	4	5
150	175	185	185	195	200

Cash Flows of Small Corp with project X

0	1	2	3	4	5
110	165	200	205	210	213

- What are the incremental cash flows associated with Small Corp's undertaking project X? Are these inflows or outflows, cost or revenue?
- What is the PV of project X under a flat term structure of 8 percent, compounded annually, irrespective of maturity?
- Under these assumptions, what is the hurdle rate? Without further calculation, determine whether the IRR for project X is higher or lower than the hurdle rate.
- (Approximately) determine the IRR.

5.- Consider the cash flows of the following projects:

	0	1	2	3	4	5
A	-1000	1000	0	0	0	0
B	-2000	1000	1000	4000	1000	1000
C	-3000	1000	1000	0	1000	1000

- If the opportunity cost of capital is 10 percent, which projects have a positive NPV?
- Calculate the payback period for each project.
- Which project(s) would a firm using the payback rule accept if the cutoff period is three years?