Professional Issues in IT

Financial Analysis of Projects

Financial Analysis of Projects

- Financial considerations are often an important consideration in selecting projects
- Three primary methods for determining the projected financial value of projects:
  - Net present value (NPV) analysis
  - Return on investment (ROI)
  - Payback analysis

Net Present Value Analysis: NPV

- NPV: a method of calculating the expected net monetary gain or loss from a project by discounting all expected future cash inflows and outflows to the present point in time
- Projects with a positive NPV should be considered if financial value is a key criterion
- The higher the NPV, the better

Calculating NPV

$$NPV = \sum_{t=0}^{n} \frac{Rt}{(1+i)^t}$$

- Each cash inflow/outflow is discounted back to its present value (PV). Then all are summed.

- R_t = net cash inflow-outflows during a single period t
- i = discount rate or return that could be earned in alternative investments
- t = number of time periods

NPV Example

	A	B	C	D	E	F	G	H	I	J
2										
3	AN. INT. RATE -->	10%								
4										
5	**PROJECT 1**	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL			
6	REVENUES	$0	$2,000	$3,000	$4,000	$5,000	$14,000			
7	COSTS	$5,000	$1,000	$1,000	$1,000	$1,000	$9,000			
8	CASH FLOW	($5,000)	$1,000	$2,000	$3,000	$4,000	**$5,000**			
9	NPV	**$2,316**								
10		Formula =npv(b3,b8:f8)								
11										
12	**PROJECT 2**	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL			
13	REVENUES	$1,000	$2,000	$4,000	$4,000	$4,000	$15,000			
14	COSTS	$2,000	$2,000	$2,000	$2,000	$2,000	$10,000			
15	CASH FLOW	($1,000)	$0	$2,000	$2,000	$2,000	**$5,000**			
16	NPV	**$3,201**								
17		Formula =npv(b3,b15:f15)								
18										
19	RECOMMEND PROJECT 2 BECAUSE IT HAS THE HIGHER NPV.									
20										
21	IF STATEMENT -->	=IF(B9>B16,A5,A12)								
22	RESULT -->	PROJECT 2								

Notice that cash flow totals are the same, but NPVs are different.

Inflation

- Inflation must be factored in when you invest money
- real return rate = nominal return rate – inflation

- if you earn a 10% on investments, but the rate of inflation is 15%, you're actually losing 5% in purchasing power each year (10% – 15% = -5%).

Return on Investment (ROI)

- ROI: income divided by investment

  ROI = (total discounted benefits - total discounted costs) / discounted costs

- The higher the ROI, the better
- Many organizations have a required rate of return or minimum acceptable rate of return on investment for projects

Payback Analysis

- Another important financial consideration is payback analysis
- The "payback period" is the amount of time it will take to recoup, in the form of net cash inflows, the net dollars invested in a project
- Payback occurs when the cumulative discounted benefits and costs are greater than zero
- Many organizations want IT projects to have a fairly short payback period

NPV, ROI, Payback Period: Ex 1

	A	B	C	D	E	F	G	H
1								
2	DISCOUNT RATE →	**10%**		**Years**				
3		**1**	**2**	**3**	**4**	**5**	**TOTAL**	
4	COSTS	($5,000)	($1,000)	($1,000)	($1,000)	($1,000)	-9,000	
5	DISCOUNT FACTOR	0.91	0.83	0.75	0.68	0.62		
6	**DISCOUNTED COSTS**	**-4,545**	**-826**	**-751**	**-683**	**-621**	**-7,427**	
7								
8	BENEFITS	$0	$2,000	$3,000	$4,000	$5,000	14,000	
9	DISCOUNT FACTOR	0.91	0.83	0.75	0.68	0.62		
10	**DISCOUNTED BENEFITS**	**0**	**1,653**	**2,254**	**2,732**	**3,105**	**9,743**	
11								
12	DISCOUNTED BENEFITS + COSTS	-4,545	826	1,503	2,049	2,484	**2,316**	← **NPV**
13	CUMULATIVE BENEFITS + COSTS	-4,545	-3,719	-2,216	-167	2,316	4,633	
14						↑		
15	ROI	31%				Payback in this year		

NPV, ROI, Payback Period: Ex 2

	A	B	C	D	E	F	G	H
1								
2	DISCOUNT RATE →	**10%**		**Years**				
3		**1**	**2**	**3**	**4**	**5**	**TOTAL**	
4	COSTS	($2,000)	($2,000)	($2,000)	($2,000)	($2,000)	-10,000	
5	DISCOUNT FACTOR	0.91	0.83	0.75	0.68	0.62		
6	**DISCOUNTED COSTS**	**-1,818**	**-1,653**	**-1,503**	**-1,366**	**-1,242**	**-7,582**	
7								
8	BENEFITS	$1,000	$2,000	$4,000	$4,000	$4,000	15,000	
9	DISCOUNT FACTOR	0.91	0.83	0.75	0.68	0.62		
10	**DISCOUNTED BENEFITS**	**909**	**1,653**	**3,005**	**2,732**	**2,484**	**10,783**	
11								
12	DISCOUNTED BENEFITS + COSTS	-909	0	1,503	1,366	1,242	**3,201**	← **NPV**
13	CUMULATIVE BENEFITS + COSTS	-909	-909	594	1,960	3,201	6,403	
14				↑				
15	ROI	42%		Payback in this year				