

Problem 8-17

Goal: Determine whether to recommend "lease and flood" project

Given: Lease a group of oil wells, implement a water flood project at end of 5 years

Time Zero investment	\$0
Years 1-4 net revenue	\$50,000
Year 5 expense	(\$650,000)
Years 6-20 net revenue	\$100,000
Discount rate	10.0%
Is this NPW ?	\$242,000

Approach: Prepare a cashflow table from given data
 Determine Net Present Worth at 10% (use Excel NPV function)
 Determine IRR Discounted Cash Flow Rate of Return (use Excel IRR function)
 Determine Net Present Worth at 10% (use Excel NPV function)

Calculations: discrete annual continuous e^r

Answer	\$227,172 =NPV(0.1,E38:E57)	\$210,519
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Discussion: The textbook suggested value NPW of \$242,000 is incorrect.
 The correct value is \$227,200 An error of 6.5%
 The Excel IRR function can not be used because the initial cash flow is NOT a negative value.
 There is no interest rate which will produce an NPW of zero!

On the basis of the positive net present worth at 10%, the lease and water flood arrangement should be recommended to be undertaken. There is no rate of interest rate (less than infinity) which will yield a zero present worth. Therefore, if the board of directors only use discounted cash flow rate of return for decision making, it will be necessary to re-educate the board to fully understand the limitations of IRR method and demonstrate the advantages of NPW method before the proposal could be presented and fully evaluated.

Cash Flow Table:

Year Cash Flow	
0	\$0
1	\$50,000
2	\$50,000
3	\$50,000
4	\$50,000
5	(\$650,000)
6	\$100,000
7	\$100,000
8	\$100,000
9	\$100,000
10	\$100,000
11	\$100,000
12	\$100,000
13	\$100,000
14	\$100,000
15	\$100,000
16	\$100,000
17	\$100,000
18	\$100,000
19	\$100,000
20	\$100,000

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4th edition Problem 10 - 14

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Year	Cash Flow	0% Cumulative	10% discounted	Cumulative 10%	20% discounted	Cumulative 20%	100% discounted	Cumulative 100%
0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1	\$50,000	\$50,000	\$45,455	\$45,455	\$41,667	\$41,667	\$25,000	\$25,000
2	\$50,000	\$100,000	\$41,322	\$86,777	\$34,722	\$76,389	\$12,500	\$37,500
3	\$50,000	\$150,000	\$37,566	\$124,343	\$28,935	\$105,324	\$6,250	\$43,750
4	\$50,000	\$200,000	\$34,151	\$158,493	\$24,113	\$129,437	\$3,125	\$46,875
5	(\$650,000)	(\$450,000)	(\$403,599)	(\$245,106)	(\$261,220)	(\$131,784)	(\$20,313)	\$26,563
6	\$100,000	(\$350,000)	\$56,447	(\$188,658)	\$33,490	(\$98,294)	\$1,563	\$28,125
7	\$100,000	(\$250,000)	\$51,316	(\$137,342)	\$27,908	(\$70,386)	\$781	\$28,906
8	\$100,000	(\$150,000)	\$46,651	(\$90,692)	\$23,257	(\$47,129)	\$391	\$29,297
9	\$100,000	(\$50,000)	\$42,410	(\$48,282)	\$19,381	(\$27,748)	\$195	\$29,492
10	\$100,000	\$50,000	\$38,554	(\$9,728)	\$16,151	(\$11,598)	\$98	\$29,590
11	\$100,000	\$150,000	\$35,049	\$25,322	\$13,459	\$1,861	\$49	\$29,639
12	\$100,000	\$250,000	\$31,863	\$57,185	\$11,216	\$13,077	\$24	\$29,663
13	\$100,000	\$350,000	\$28,966	\$86,151	\$9,346	\$22,423	\$12	\$29,675
14	\$100,000	\$450,000	\$26,333	\$112,484	\$7,789	\$30,212	\$6	\$29,681
15	\$100,000	\$550,000	\$23,939	\$136,424	\$6,491	\$36,702	\$3	\$29,684
16	\$100,000	\$650,000	\$21,763	\$158,187	\$5,409	\$42,111	\$2	\$29,686
17	\$100,000	\$750,000	\$19,784	\$177,971	\$4,507	\$46,618	\$1	\$29,687
18	\$100,000	\$850,000	\$17,986	\$195,957	\$3,756	\$50,375	\$0.38	\$29,687
19	\$100,000	\$950,000	\$16,351	\$212,308	\$3,130	\$53,505	\$0.19	\$29,687
20	\$100,000	\$1,050,000	\$14,864	\$227,172	\$2,608	\$56,113	\$0.10	\$29,687
		\$1,050,000		\$227,172.11		\$56,113.07		\$29,687.40

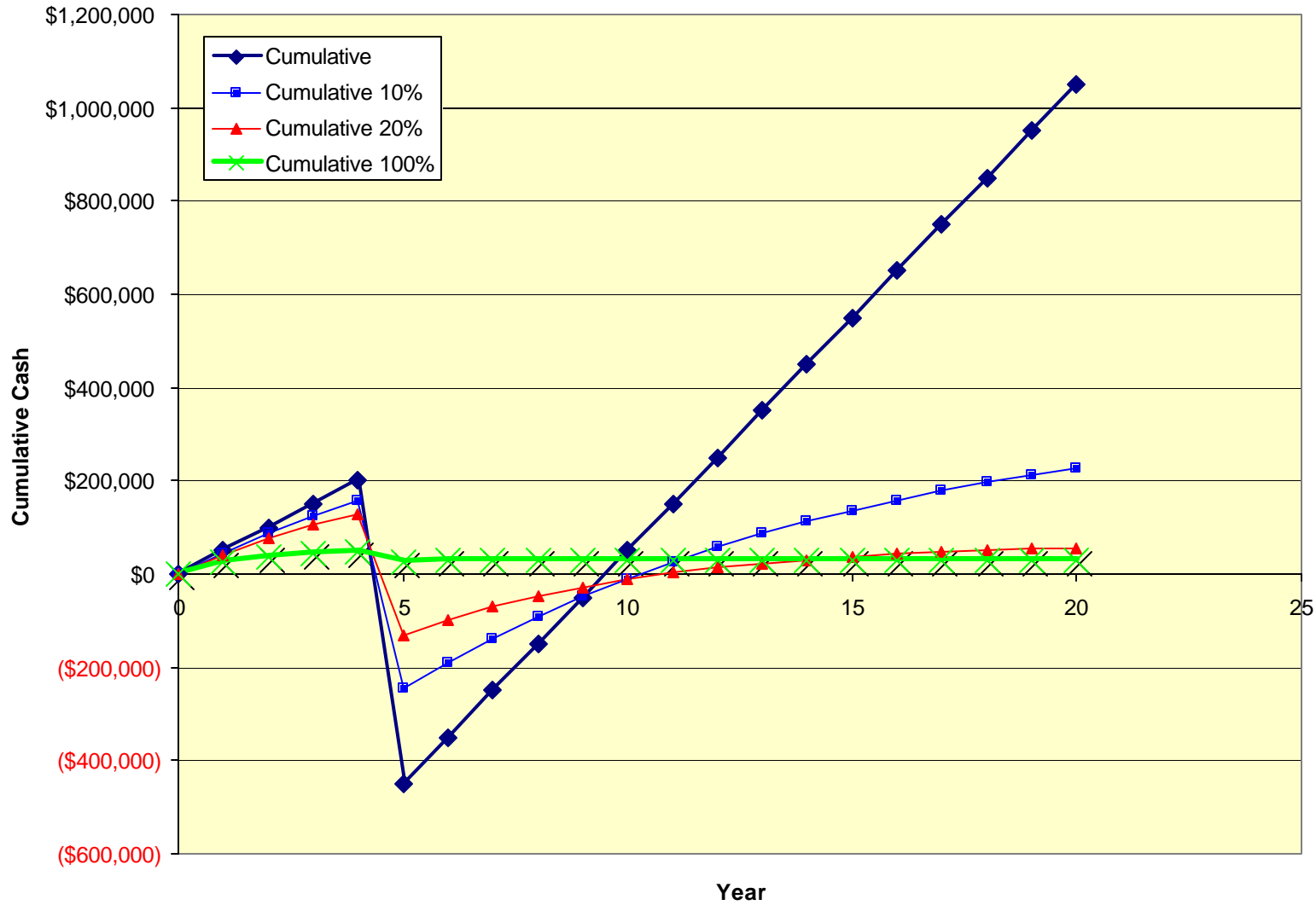
Present Worth Excel NPV

Alternate Continuous Interest:

Year	Cash Flow / EXP(r*j)							
	Cash Flow	0% Cumulative	10% continuous	Cumulative cont.10%	20% discounted	Cumulative 20%	100% discounted	Cumulative 100%
0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1	\$50,000	\$50,000	\$45,242	\$45,242	\$40,937	\$40,937	\$18,394	\$18,394
2	\$50,000	\$100,000	\$40,937	\$86,178	\$33,516	\$74,453	\$6,767	\$25,161
3	\$50,000	\$150,000	\$37,041	\$123,219	\$27,441	\$101,893	\$2,489	\$27,650
4	\$50,000	\$200,000	\$33,516	\$156,735	\$22,466	\$124,360	\$916	\$28,566
5	(\$650,000)	(\$450,000)	(\$394,245)	(\$237,510)	(\$239,122)	(\$114,762)	(\$4,380)	\$24,186
6	\$100,000	(\$350,000)	\$54,881	(\$182,628)	\$30,119	(\$84,643)	\$248	\$24,434
7	\$100,000	(\$250,000)	\$49,659	(\$132,970)	\$24,660	(\$59,983)	\$91	\$24,525
8	\$100,000	(\$150,000)	\$44,933	(\$88,037)	\$20,190	(\$39,793)	\$34	\$24,559
9	\$100,000	(\$50,000)	\$40,657	(\$47,380)	\$16,530	(\$23,263)	\$12	\$24,571
10	\$100,000	\$50,000	\$36,788	(\$10,592)	\$13,534	(\$9,730)	\$5	\$24,576
11	\$100,000	\$150,000	\$33,287	\$22,695	\$11,080	\$1,350	\$2	\$24,577
12	\$100,000	\$250,000	\$30,119	\$52,814	\$9,072	\$10,422	\$1	\$24,578
13	\$100,000	\$350,000	\$27,253	\$80,068	\$7,427	\$17,850	\$0.23	\$24,578
14	\$100,000	\$450,000	\$24,660	\$104,727	\$6,081	\$23,931	\$0.08	\$24,578
15	\$100,000	\$550,000	\$22,313	\$127,040	\$4,979	\$28,909	\$0.03	\$24,578
16	\$100,000	\$650,000	\$20,190	\$147,230	\$4,076	\$32,986	\$0.01	\$24,578
17	\$100,000	\$750,000	\$18,268	\$165,498	\$3,337	\$36,323	\$0.004	\$24,578
18	\$100,000	\$850,000	\$16,530	\$182,028	\$2,732	\$39,055	\$0.002	\$24,578
19	\$100,000	\$950,000	\$14,957	\$196,985	\$2,237	\$41,292	\$0.001	\$24,578
20	\$100,000	\$1,050,000	\$13,534	\$210,519	\$1,832	\$43,124	\$0.0002	\$24,578
		\$1,050,000		\$210,518.60		\$43,123.86		\$24,578.34
Present Worth Excel NPV				10.5171%		22.1403%		171.8282%

continuous compounding is effective discrete annual

Problem 8-17



Present Worth from Year 5 on								
Internal Rate of Return	12.88784%							
		10%		20%		12.8878%		
0	(\$650,000)	(\$650,000)	(\$650,000)	(\$650,000)	(\$650,000)	(\$650,000)	(\$650,000)	(\$650,000)
1	\$100,000	(\$550,000)	\$90,909	(\$559,091)	\$83,333	(\$566,667)	\$88,584	(\$561,416)
2	\$100,000	(\$450,000)	\$82,645	(\$476,446)	\$69,444	(\$497,222)	\$78,470	(\$482,946)
3	\$100,000	(\$350,000)	\$75,131	(\$401,315)	\$57,870	(\$439,352)	\$69,512	(\$413,434)
4	\$100,000	(\$250,000)	\$68,301	(\$333,013)	\$48,225	(\$391,127)	\$61,576	(\$351,858)
5	\$100,000	(\$150,000)	\$62,092	(\$270,921)	\$40,188	(\$350,939)	\$54,546	(\$297,312)
6	\$100,000	(\$50,000)	\$56,447	(\$214,474)	\$33,490	(\$317,449)	\$48,319	(\$248,993)
7	\$100,000	\$50,000	\$51,316	(\$163,158)	\$27,908	(\$289,541)	\$42,803	(\$206,191)
8	\$100,000	\$150,000	\$46,651	(\$116,507)	\$23,257	(\$266,284)	\$37,916	(\$168,275)
9	\$100,000	\$250,000	\$42,410	(\$74,098)	\$19,381	(\$246,903)	\$33,587	(\$134,687)
10	\$100,000	\$350,000	\$38,554	(\$35,543)	\$16,151	(\$230,753)	\$29,753	(\$104,935)
11	\$100,000	\$450,000	\$35,049	(\$494)	\$13,459	(\$217,294)	\$26,356	(\$78,578)
12	\$100,000	\$550,000	\$31,863	\$31,369	\$11,216	(\$206,078)	\$23,347	(\$55,231)
13	\$100,000	\$650,000	\$28,966	\$60,336	\$9,346	(\$196,732)	\$20,682	(\$34,550)
14	\$100,000	\$750,000	\$26,333	\$86,669	\$7,789	(\$188,943)	\$18,321	(\$16,229)
15	\$100,000	\$850,000	\$23,939	\$110,608	\$6,491	(\$182,453)	\$16,229	\$0

Problem 8-17 5th Year Forward

