FINANCE 100 MACKINLAY

NETCO SOLUTION (2013)

(All flows are reported as revenues including the E.A.C's.)

Alternative 1: Overhaul

Before Tax Op Costs	Capitalized Investment	Expensed Investment
-1800	545	440

year end	after tax op costs	dep'n tax shield	expense tax shield	net cashflow	discount factor	P.V. net cashflow
2014	-1170	161	154	-855	0.870	-744
2015	-1205	61		-1144	0.756	-865
2016	-1241	37		-1205	0.658	-792
2017	-1278	22		-1257	0.572	-718
2018	-1317	22		-1295	0.497	-644
2019	-1356	11		-1345	0.432	-582
2020	-1397			-1397	0.376	-525
2021	-1439			-1439	0.327	-470
					P.V.cashflow	-5340
					Init. Inv.	-985
					Oppor cost	-480
					PV Sal Val	21
					Total	-6784
		real rate	0.117		Ann.Fac.	5.029
					E.A.C. (Rev)	-1349

NOTES:

1. Operating costs and tax shields are assumed to be flow at year end.
2. Operating costs are expressed in nominal terms and hence increase at the inflation rate of 3% per year.
3. 2014 depreciation tax shield includes $122,250 from extra $350000 of depreciation.
4. The incremental opportunity costs of not selling the old boat are calculated as $550,000 less the tax liability of $70,000 on a gain of $200000.

Alternative 2: Purchase New Boat

Before Tax Op Costs	Capitalized Investment	Expensed Investment
-1350	4400	0

year end	after tax op costs	dep'n tax shield	expense tax shield	net cashflow	discount factor	P.V. net cashflow
2014	-878	308	0	-570	0.870	-495
2015	-904	493		-411	0.756	-311
2016	-931	296		-635	0.658	-418
2017	-959	177		-781	0.572	-447
2018	-988	177		-810	0.497	-403
2019	-1017	89		-929	0.432	-401
2020	-1048			-1048	0.376	-394
2021	-1079			-1079	0.327	-353
2022	-1112			-1112	0.284	-316
2023	-1145			-1145	0.247	-283
2024	-1179			-1179	0.215	-253
2025	-1215			-1215	0.187	-227
					P.V.cashflow	-4301
					init inv.	-4400
					training	-91
					total	-8792
		real rate	0.117		Ann.Fac.	6.296
					E.A.C. (Rev)	-1396

NOTES:
1. Operating costs and tax shields are assumed to be flow at year end.
2. Operating costs are expressed in nominal terms and hence increase at the inflation rate of 3% per year. Costs are reduced by extra revenue of $150000.
3. The training costs are calculated using $140,000 and are assumed to be paid at the start of 2014.

Conclusion:

To decide between alternative 1 (overhaul) and 2(new boat) we need to use the equivalent annual cost (EAC) since alternative 2 has a longer life. Using a real rate of 11.7% we find that alternative 1 has an EAC of $1,349,000 whereas alternative 2 has an EAC of $1,396,000. A comparison of the EAC's leads us to choose the overhaul option.
Since the real costs are stable through time, the EAC is computed using the real rate of 11.7%.