

CHAPTER FOUR

RESEARCH RESULTS

This chapter presents the results obtained from the analyses based on the methodology described in Chapter Three. The explanations of the financial analyses and results are also given in this chapter.

4.1 Phase 1

4.1.1 Profit and Loss (P&L) Account

The mode of privatisation used in Phase 1 is MC. Table 4.1 shows the P&L Account for Phase 1 from 1993 to 2003. The private operator of Phase 1 (Perangsang Group) did not contribute in the funding of Phase 1 capital cost. Thus, the capital cost item is taken as being equal to zero. It is observed that the highest profit (after tax) can be obtained when the contract expires in year 2003. The CAGR for profit after tax with a value of 1.3% was calculated for Phase 1.

4.1.2 Cash Flow Analysis

Table 4.2 shows the projected cash flow. The analysis shows that the project has been earning interest income from the beginning until the end of the contract. The highest interest income with a value of RM 11.3 million was obtained when the contract expires in year 2003. This is mainly because no capital cost is involved. Furthermore, the revenue collected is sufficient to cover all the operating costs through out the years.

Table 4.1: Profit & Loss Account - Phase 1

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Capital Cost	0										
Revenue:											
475 Mld	43.3	45.9									
950 Mld			97.4	103.2	109.4	116.0	123.0	130.3	138.2	146.5	155.2
O&M Cost:											
475 Mld	-40.0	-41.6									
950 Mld			-86.6	-90.1	-93.7	-97.4	-101.3	-105.4	-109.6	-114.0	-118.5
Depreciation:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interest (Expenses)/Income:	0.1	0.3	0.7	1.3	2.1	3.1	4.2	5.6	7.2	9.1	11.3
Profit Before Tax	3.4	4.6	11.4	14.5	17.8	21.6	25.9	30.6	35.8	41.6	48.0
Less Tax at 30%	1.0	1.4	3.4	4.3	5.4	6.5	7.8	9.2	10.7	12.5	14.4
Profit After Tax	2.4	3.2	8.0	10.1	12.5	15.1	18.1	21.4	25.1	29.1	33.6

30

Compounded Average Growth Rate (CAGR) For Profit After Tax = $(33.6/2.4)^{(1/10)} = 1.30 \%$

All figures shown are denoted in RM (million) unless otherwise stated.

Source: Author's Computation

Table 4.2: Cash Flow Analysis - Phase 1

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Profit Before Tax	3.4	4.6	11.4	14.5	17.8	21.6	25.9	30.6	35.8	41.6	48.0
Depreciation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Operating Cash Flow	3.4	4.6	11.4	14.5	17.8	21.6	25.9	30.6	35.8	41.6	48.0
Less: Tax	1.0	1.4	3.4	4.3	5.4	6.5	7.8	9.2	10.7	12.5	14.4
Capital Expenditure											
Additional Cash/Debt	2.4	3.2	8.0	10.1	12.5	15.1	18.1	21.4	25.1	29.1	33.6
Net Cash/Debt at start	0.0	2.4	5.6	13.6	23.7	36.2	51.3	69.4	90.8	115.9	145.0
Net Cash/Debt at end	2.4	5.6	13.6	23.7	36.2	51.3	69.4	90.8	115.9	145.0	178.6
Average Cash	1.2	4.0	9.6	18.6	30.0	43.8	60.4	80.1	103.4	130.5	161.8
Interest Income	0.1	0.3	0.7	1.3	2.1	3.1	4.2	5.6	7.2	9.1	11.3

All figures shown are denoted in RM (million) unless otherwise stated.

Source: Author's Computation

4.1.3 Free Cash Flow Analysis

Table 4.3 provides the free cash flow analysis to Phase 1. It is observed that the net cash flow has been increasing through out the project's life period. The value of NPV obtained from this analysis is RM 136.1 million using a profit CAGR discounted rate of 1.30%. This implies that the project has an overall excess return of RM 136.1 million according to the entire contract.

4.1.4 Sensitivity Analysis

The result of the sensitivity analysis is showed in Table 4.4. The different values are obtained using different discount rates. For a range of discount rates used between 5% - 13%, positive value NPVs were obtained. This implies that profits are made through out the contract period with these discount rates. It also shows that NPV tends to be higher when lower discount rates are used. This reflects an inverse relationship between discount rate and NPV. The highest NPV of RM 108.6 million was obtained using 5% discount rate.

4.1.5 Equivalent Annual Annuity (EAA) Analysis

Figure 4.1 shows the value of the EAA, which was calculated using the CAGR of 1.30%, giving a NPV of RM 136.1 million. The EAA obtained in this case is RM 13.36 million and perpetuity value is RM 1027.6 million. This means that Phase 1 will receive an equivalent annual income of RM 13.4 million through out the years to make up a NPV of RM 136.1 million using the CAGR of 1.34%. Assuming the MC for Phase 1 is to carry on until infinity, the perpetuity value of the project is RM 1027.6 million.

Table 4.3 : Free Cash Flow Analysis - Phase 1

Main Parameter : Discount rate = 1.30%

0.013

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Revenue:											
475 Mld	43.3	45.9									
950 Mld			97.4	103.2	109.4	116.0	123.0	130.3	138.2	146.5	155.2
O&M Cost:											
475 Mld	-40.0	-41.6									
950 Mld			-86.6	-90.1	-93.7	-97.4	-101.3	-105.4	-109.6	-114.0	-118.5
Less Tax at 30%	0.0	1.0	1.4	3.4	4.3	5.4	6.5	7.8	9.2	10.7	12.5
Cash Flow	3.3	3.3	9.4	9.7	11.4	13.2	15.1	17.2	19.4	21.7	24.2
Capital Cost											
Net Cash Flow	3.3	3.3	9.4	9.7	11.4	13.2	15.1	17.2	19.4	21.7	24.2
Present value	3.3	3.2	9.2	9.4	10.8	12.4	14.0	15.7	17.5	19.3	21.3
NPV	136.1										

All figures shown are denoted in RM (million) unless otherwise stated.

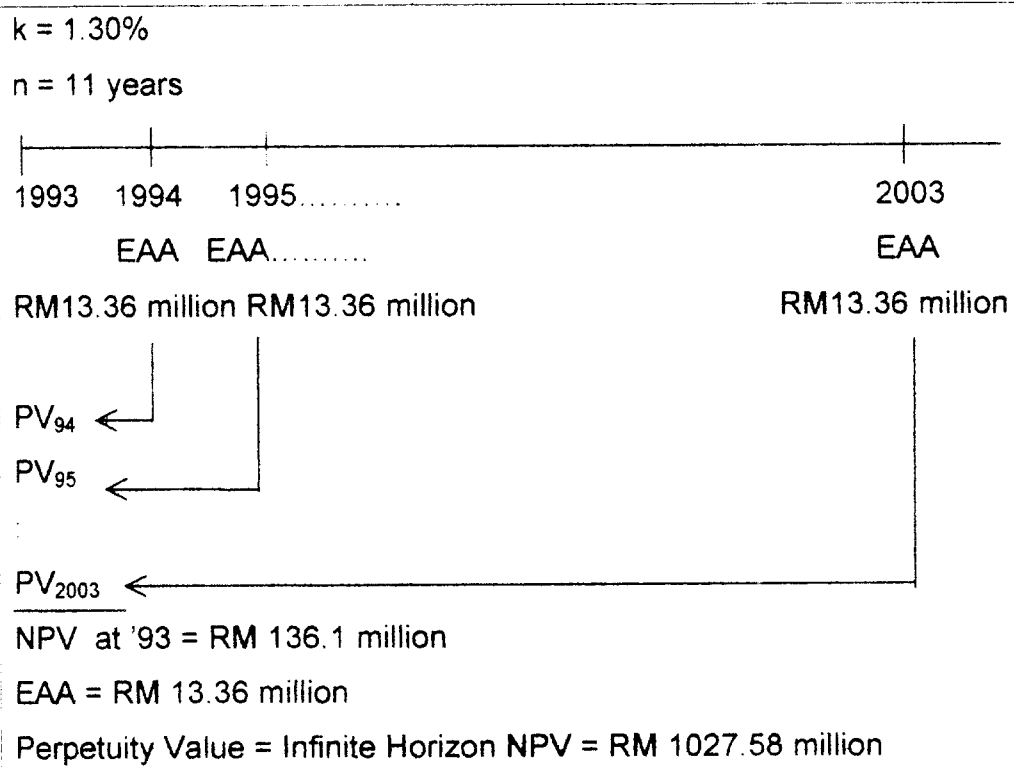
Source: Author's Computation

Table 4.4: Sensitivity Analysis – Phase 1

Discount Rate	Net Present Value RM (million)
5%	108.6
6%	102.5
7%	96.9
8%	91.6
9%	86.8
10%	82.3
11%	78.2
12%	74.3
13%	70.7

Source: Author's Computation

Figure 4.1 Equivalent Annual Annuity (EAA) Analysis – Phase 1



Source: Author's Computation

4.2 Phase 2

4.2.1 Profit and Loss (P&L) Account

Table 4.5 shows the P&L Account for Phase 2 from 1996 – 2020. The capital cost of Phase 2 is entirely funded by PNSB over a period of 6 years from 1996 to 2001. It is observed that the project has started to obtain positive profit after tax only from year 2005. The project highest profit (after tax) with a value of RM 526.9 million can be obtained when the contract expires in year 2020.

4.2.2 Cash Flow Analysis

Table 4.6 shows the project's cash flow. The analysis shows that the project has started to earn interest income only from year 2013 onwards. Prior to year 2013, interest expenses were incurred to cover its capital cost. It shows that the highest interest income obtained is RM 221.3 million in year 2020.

4.2.3 Free Cash Flow Analysis

Table 4.7 provides the calculation of Puncak Niaga's beta. The record of Puncak Niaga's stock prices and Emas Indexes from 11/8/97 to 12/11/97 were obtained. A beta value of 1.57 is obtained by carrying out linear regression on their corresponding rate of returns.

Table 4.8 provides the details of WACC computation. A value of -4.5% is obtained for the cost of equity. The after tax cost of debt is equal to 7% per annum. The WACC of Puncak Niaga is equal to 4.70%. This value will be used as the discount rate for the Phase 2.

Table 4.5: Profit & Loss Account - Phase 2

	Stage 1	Stage 2																								
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Capital Cost:	-271.7	-385.1	-385.1	-113.4	-113.4	-113.4																				
Revenue:																										
475 Mld				96.4	102.2	108.3																				
950 Mld							293.7	311.3	329.98	349.8	370.8	393	416.6	441.6	468.1	496	525.9	557.5	590.9	626.4	664	703.8	746.1	790.8	838.3	
O&M Cost:																										
475 Mld				-52.76	-54.87	-57.06																				
950 Mld							119	123	128.4	134	139	144.4	150.2	156	162.4	169	176	183	190	197.6	206	214	222.3	231.2	240	
Depreciation:																										
				-37.05	-37.05	-37.05	-66.9	-66.9	-66.89	-66.9	-66.9	-66.89	-66.89	-66.9	-66.89	-66.9	-66.9	-66.9	-66.9	-66.89	-66.9	-66.9	-66.89	-66.89	-66.9	
Interest (Expenses) /Income:																										
				-124.1	-142.8	-152.7	-157	-154	-150	-144	-135	-124.3	-110.3	-92.8	-71.49	-45.7	-14.9	11.49	32.97	56.86	83.35	112.6	145.9	182	221.9	
Profit Before Tax	0	0	0	-117.5	-132.5	-138.5	-48.7	-33.3	-15.27	5.601	29.7	57.44	89.27	125.7	167.3	215	268.5	319.4	367	418.8	474.9	535.8	602.8	674.7	752.7	
Less Tax at 30%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	95.8	110.1	125.6	142.5	160.7	180.8	202.4	225.8	
Profit After Tax	0	0	0	-117.5	-132.5	-138.5	-48.7	-33.3	-15.27	5.601	29.7	57.44	89.27	125.7	167.3	215	268.5	223.6	256.9	293.1	332.4	375.1	421.9	472.3	526.9	

36

All figures shown are denoted in RM (million) unless otherwise stated.
 Source: Author's Computation

Table 4.6: Cash Flow Analysis - Phase 2

	Stage 1		Stage 2																							
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Profit Before Tax				-117.5	-132.5	-138.5	-48.7	-33.3	-15.27	5 6008	29.7	57.44	89.26	125.7	167.2	215	268.5	319.4	367	418.8	474.9	535.8	602.5	675	752.9	
Depreciation				37.045	37.045	37.05	66.89	66.89	66.888	66.888	66.89	66.89	66.89	66.89	66.89	66.9	66.89	66.89	66.89	66.89	66.89	66.89	66.89	66.89	66.89	66.89
Operating Cash Flow				-80.46	-95.5	-101.4	18.15	33.62	51.619	72.488	96.59	124.3	156.1	192.6	234.1	281	335.4	386.3	433.9	485.7	541.8	602.7	669.4	741.9	819.8	
Less Tax				0	0	0	0	0	0	0	0	0	0	0	0	0	0	95.8	109.9	125.6	141.8	160.5	180.8	202	225.8	
Less Capital Cost	-271.7	-385.1	-385.1	-113.4	-113.4	-113.4																				
Additional Cash/Debt	-271.7	-385.07	-385.1	-193.9	-95.5	-101.4	18.15	33.62	51.619	72.488	96.59	124.3	156.1	192.6	234.1	281	335.4	290.5	323.9	360.1	400	442.2	488.6	539.9	594	
Net Cash/Debt at start	0	-271.67	-670.3	-1102	-1381	-1476	-1577	-1559	-1526	-1474	-1402	-1305	-1181	-1025	-832	-598	-316	19.01	309.5	633.5	993.6	1394	1836	2324	2864	
Net Cash/Debt at end	-271.7	-670.32	-1102	-1381	-1476	-1577	-1559	-1526	-1474	-1402	-1305	-1181	-1025	-832	-597.9	-316	19.01	309.5	633.5	993.6	1394	1836	2324	2864	3458	
Average Cash				-1241	-1428	-1527	-1568	-1543	-1500	-1438	-1353	-1243	-1103	-928	-714.9	-457	-149	164.3	471.5	813.5	1194	1615	2080	2594	3161	
Interest (Expense)/ Income:				-124.1	-142.8	-152.7	-157	-154	-150	-143.8	-135	-124.3	-110.3	-92.8	-71.49	-45.7	-14.9	11.5	33.01	56.95	83.4	113	145.6	181.6	221.3	

37

All figures shown are denoted in RM (million) unless otherwise stated.
Source: Author's Computation

Table 4.7 Estimation of Beta

PUNCAK NIAGA's Stock Price			EMAS INDEX		
Date	Price Line(M\$)	Return (%)	Date	Index	Return (%)
8/11/97	3.96		8/11/97	261.64	
8/12/97	4	1.010	8/12/97	259.21	-0.929
8/13/97	4.02	0.500	8/13/97	261.68	0.953
8/14/97	4.1	1.990	8/14/97	264.01	0.890
8/15/97	4.12	0.488	8/15/97	261.99	-0.765
8/18/97	4	-2.913	8/18/97	255.06	-2.646
8/19/97	4.12	3.000	8/19/97	255.72	0.259
8/20/97	4.18	1.456	8/20/97	265.8	3.942
8/21/97	4.1	-1.914	8/21/97	261.45	-1.637
8/22/97	4.1	0.000	8/22/97	259.78	-0.639
8/25/97	4.1	0.000	8/25/97	254.95	-1.859
8/26/97	4.08	-0.488	8/26/97	248.21	-2.644
8/27/97	4.12	0.980	8/27/97	245.42	-1.124
8/28/97	3.2	-22.330	8/28/97	223.44	-8.956
8/29/97	2.97	-7.188	8/29/97	219.48	-1.772
9/1/97	2.97	0.000	9/1/97	219.48	0.000
9/2/97	3.06	3.030	9/2/97	219.93	0.205
9/3/97	2.99	-2.288	9/3/97	210.29	-4.383
9/4/97	2.85	-4.682	9/4/97	204.93	-2.549
9/5/97	3.96	38.947	9/5/97	231.18	12.809
9/8/97	3.98	0.505	9/8/97	249.49	7.920
9/9/97	4.02	1.005	9/9/97	251.16	0.669
9/10/97	3.98	-0.995	9/10/97	244.96	-2.469
9/11/97	3.9	-2.010	9/11/97	238.34	-2.702
9/12/97	4.06	4.103	9/12/97	242.88	1.905
9/15/97	4.04	-0.493	9/15/97	240.69	-0.902
9/16/97	4.08	0.990	9/16/97	235.95	-1.969
9/17/97	4	-1.961	9/17/97	231.18	-2.022
9/18/97	4.06	1.500	9/18/97	225.55	-2.435
9/19/97	4.14	1.970	9/19/97	226	0.200
9/22/97	4.04	-2.415	9/22/97	218.19	-3.456
9/23/97	4.06	0.495	9/23/97	223.78	2.562
9/24/97	4.1	0.985	9/24/97	222.48	-0.581
9/25/97	4.18	1.951	9/25/97	224.56	0.935
9/26/97	4.34	3.828	9/26/97	226.82	1.006
9/29/97	4.44	2.304	9/29/97	228.42	0.705
9/30/97	4.44	0.000	9/30/97	229.57	0.503
10/1/97	4.3	-3.153	10/1/97	224.89	-2.039
10/2/97	4.24	-1.395	10/2/97	223.74	-0.511
10/3/97	4.26	0.472	10/3/97	224.89	0.514
10/6/97	4.32	1.408	10/6/97	223.38	-0.671
10/7/97	4.34	0.463	10/7/97	226.5	1.397
10/8/97	4.36	0.461	10/8/97	235.18	3.832
10/9/97	4.34	-0.459	10/9/97	231.59	-1.526
10/10/97	4.36	0.461	10/10/97	234.02	1.049
10/13/97	4.46	2.294	10/13/97	233.49	-0.226
10/14/97	4.42	-0.897	10/14/97	232.18	-0.561
10/15/97	4.42	0.000	10/15/97	227.23	-2.132
10/16/97	4.62	4.525	10/16/97	227.51	0.123
10/17/97	4.5	-2.597	10/17/97	226.16	-0.593
10/20/97	4.4	-2.222	10/20/97	219.32	-3.024
10/21/97	4.36	-0.909	10/21/97	216.89	-1.199
10/22/97	4.38	0.459	10/22/97	208.97	-3.563
10/23/97	4.4	0.457	10/23/97	203.04	-2.838
10/24/97	4.38	-0.455	10/24/97	199.87	-1.561
10/27/97	4.4	0.457	10/27/97	198.97	-0.450
10/28/97	3.88	-11.818	10/28/97	184.79	-7.127
10/29/97	4	3.093	10/29/97	188.28	1.889
10/30/97	4	0.000	10/30/97	188.28	0.000
10/31/97	3.94	-1.500	10/31/97	188.83	0.292
11/3/97	4.1	4.061	11/3/97	201.82	6.879
11/4/97	4.2	2.439	11/4/97	204.14	1.150
11/5/97	4.16	-0.952	11/5/97	205.47	0.652
11/6/97	4.18	0.481	11/6/97	204.72	-0.365
11/7/97	4.14	-0.957	11/7/97	199.66	-2.472
11/10/97	4.02	-2.899	11/10/97	194.79	-2.439
11/11/97	4.02	0.000	11/11/97	194.94	0.077
11/12/97	4.02	0.000	11/12/97	192.75	-1.123

Average Market Return Rate : -0.41

Beta estimated by using linear regression method 1.567

Source: Author's Computation

Table 4.8: WACC of Puncak Niaga

(I) Cost of Equity, K_e using Capital Asset Pricing Model (CAPM)

$$K_e = K_{RF} + (K_M - K_{RF}) * b$$

Where,

$$K_{RF}^* = \text{Expected Market Rate of Return} = 6.8\%$$

$$K_M = \text{Risk Free Rate of Return} = -0.411\%$$

$$b = 1.57$$

Thus, $K_e = -4.5\%$

(II) Cost of Debt, K_d

$$K_d = \text{Interest Rate} (1 - \text{Tax})$$

$$= 10\% * (1 - 0.3)$$

$$= 7\%$$

Thus, $K_d = 7\%$

(III) Weighted Average Cost of Capital, WACC

$$\text{WACC} = w_e * K_e + w_d * K_d$$

Where,

$$w_e = \text{Weight of Equity} = 0.2$$

$$K_e = \text{Cost of Equity} = -4.5\%$$

$$w_d = \text{Weight of Debt} = 0.8$$

$$K_d = \text{Cost of Debt} = 7\%$$

Thus, WACC = 4.7%

Source: Author's Computation

Table 4.9 provides the free cash flow analysis to Phase 2. It is observed that the value of net cash flow has been increasing through out the project's life period. The project has started to obtain positive net cash flow only from year 2002 onwards. The value of NPV obtained from this analysis is RM 1594.8 million using the WACC discounted rate of 4.7%. This implies that the project obtains an overall profit of RM 1594.8 million using a discount rate 4.7%. The relatively high NPV obtained may be due to the relatively high bulk supply tariff charged to the government.

4.2.4 Sensitivity Analysis

Table 4.10 tabulates the results of sensitivity analysis. The different NPVs are obtained using different discount rates. Similarly, NPV become higher when lower value of discount rates are used. The highest NPV obtained is RM 1594.8 million using WACC of 4.7% discount rate. A negative NPV with a value of RM -78.8 million was observed when using 13% discount rate.

4.2.5 Equivalent Annual Annuity (EAA) Analysis

Figure 4.2 shows the value of the EAA, which was calculated using the WACC discount rate of 4.7% giving a NPV of RM 1594.8 million. The value of EAA obtained in this case is RM 109.78. This implies the project will receive an equivalent annual income of RM 109.78 million to make up a NPV of RM 1594.8 million. The perpetuity value of the project is RM 1223.68 million by assuming that Phase 2 is to be continued into infinity.

Table 4.9: Free Cash Flow Analysis - Phase 2

Main Parameter Discount rate = 4.7% 0.047

	Stage1	Stage 2																								
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Revenue:																										
475 Mld				96 418	102 2	108 3																				
950 Mld							293 7	311 3	329 98	349 78	370 8	393	416 6	441 6	468 1	496	525 9	557 5	590 9	626 4	664	703 8	746 1	790 8	838 3	
O&M Cost:																										
475 Mld				-52 76	-54 87	-57 06																				
950 Mld							-119	-123	-128.4	-133 5	-139	-144 4	-150.2	-156	-162 4	-169	-176	-183	-190	-197 6	-206	-214	-222 3	-231 2	-240	
Less Tax at 30%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	95 8	110 1	125 6	142 5	160 7	180 8	202 4	
Operating Cash Flow	0	0	0	43 662	47 336	51 27	175	187 9	201 61	216 27	231 9	248 6	266 4	285 4	305 7	327	350 3	374 8	305 1	318 7	332 8	347 6	363	378 8	395 4	
Capital Cost	-271 7	-385 1	-385 1	-113 4	-113 4	-113 4																				
Free Cash Flow	-271 7	-385 07	-385 1	-69 74	-66 06	-62 13	175	187 9	201 61	216 27	231 9	248 6	266 4	285 4	305 7	327	350 3	374 8	305 1	318 7	332 8	347 6	363	378 8	395 4	
Present value	-271 7	-367 78	-351 3	-60 76	-54 98	-49 38	132 8	136 2	139 62	143 05	146 5	150	153 5	157 1	160 7	164	168	171 7	133 5	133 2	132 8	132 5	132 2	131 7	131 3	
NPV	1594.8																									

All figures shown are denoted in RM (million) unless otherwise stated.

Source: Author's Computation

Table 4.10: Sensitivity Analysis – Phase 2

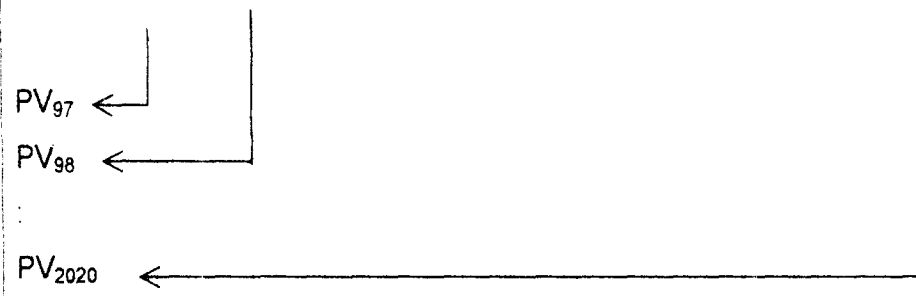
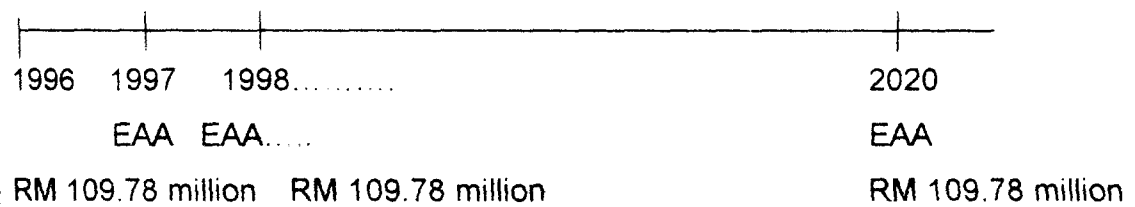
Discount Rate	Net Present Value RM (million)
5%	1485.4
6%	1159.2
7%	884.4
8%	652.3
9%	455.7
10%	288.7
11%	146.5
12%	25.1
13%	-78.8

Source: Author's Computation

Figure 4.2: Equivalent Annual Annuity (EAA) Analysis – Phase 2

$k = 4.7\%$

$n = 25$ years



NPV at '96 = RM 1594.8 million

EAA = RM 109.78 million

Perpetuity Value = Infinite Horizon NPV = RM 2335.68 million

Source: Author's Computation