Table 8.4.5 Reductions in Cargo Handling Expenses (Shadow Price: without case)

45)	18. 35 05 (2014 3) A 14 14 20 5 15 3 The start of starts	Reductions in expenses for cargo handling by barges	Reductions in cargo handling expenses due to the difference between jetty and reclaimed type wharfs
7: [[5]		Casag (4) / 1,415 (4) / 1,426	19 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

# 8.5. Economic Evaluation

#### 8.5.1. Internal Rate of Return (IRR)

There are several indices for evaluating economic returns of a project. Here, the economic returns are evaluated in terms of the Internal Rate of Return (IRR) and B/C Ratio. The IRR is obtained from the following equation.

$$\sum_{i=0}^{n-1} \frac{Bi - Ci}{(1 + IRR)^i} = 0$$

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તમે, અમુ લોકેજ કે કે તમારે, તમે કારો તમે તમારા કરે કરતા માટે તમારા માટે છે.

n = Period of calculation of IRR Here, Bi = Amount of benefit at i-th year Ci = Amount of cost at i-th year

Project life will be mean useful lifetime weighted by individual cost, which comes to 23 years. The internal rate of return will be calculated for the period of the mean useful lifetime, including construction period. The results of calculation of internal rate of return (IRR) are as follows:

For market price:

15.0% (Table 8.5.1)

For shadow price:

15.8% (Table 8.5.8)

The B/C ratio for market price is 1.21 as per Table 8.5.9. and the B/C ratio for shadow price is 1.27 as per Table 8.5.10.

The discount rate used to calculate the B/C ratio is 12%.

#### 8.5.2. Evaluation

There are valous views concerning the critical percentage of IRR used to guide a judgement as to whether a project is feasible or not. The leading view is that the project is feasible if the IRR exceeds the opportunity cost of capital, which is said to be 12% in Indonesia.

In this case the B/C ratio is 1.21, which justifies the project. The results of sensitivity analyses for unforeseen change of costs and benefits are shown in Table 8,4:2 ~ 8.4.7 and as shown IRR is calculated to decrease by about 1% when the benefits is decreased by 5% or the costs increased by 5% Even with the benefits 15% less than those estimated in the previous section, the IRR is calculated at 12.7% which exceeds the opportunity cost in Indonesia.

Purther, the effects of the project are not limited to the quantitative effects already discussed. In general it is to be expected that this project will bring a wide range of benefits to the national economy of the Republic of Indonesia as well as stimulating regional development. 8.5. Economic Evaluation - sold is a sold in all this project is evaluated as being fully feasible.

# 8.5.1. Internal Rate of Return (IRR)

There are several indices for evaluating economic returns of a project. Here, the economic reluters are evaluated in terms of the Internal Rate of Return (IRR) and B/C Ratio, The IRR is obtained from the following equation.

$$\sum_{i=0}^{n-1} \frac{Bi - Ci}{(1+IRR)^i} = 0$$

Here, n = Period of calculation of IRR and the grade Bi = Amount of benefit at i-th year G = Amount of cost at i-th year

Project life will be mean useful lifetime weighted by individual cost, which comes to 23 years. The internal rate of return will be calculated for the period of the mean useful lifetime, including construction period. The results of calculation of internal rate of return (IRR) are as follows:

For market price:

15.0% (Table 8.5.1) 15.8% (Table 8.5.8)

The B/C ratio for market price is 1.21 as per Table 3.5.9, and the B/C ratio for shadow price

is 1.27 as per Table 8.5.10. The discount rate used to calculate the B/C ratio is 12%.

# Table 8.5.1 is Internal Rate of Return Calculation Sheet

(etuese	165*12.7% 1601 181-1143	99. NS - 1100	188=15,9% (Unit 1998US\$)
isii Noddinean	O establis Dinks policy Dinks policy Dinks policy Demateupa Cost	ta Operation of trace &	og BENEFITS aving in Saving in Net nip Mail-Cargo Hand Benefit ng Cost
81 9,1984	6 1,8669 1,8	64 86	85,1 850,1 8 450,066
92 8,1985	6 4,8975 4,8		85,7 857 8 450,087
63 1,1986 64 8,1987 55 8,1988 64 8,1989 67 8,1989	2,48 2,48 2 2,71 232,731,81 2 2,61,732,738,11,447 2,87,812,11,457 2,37,812,11,457	489 80 86 42565 327672 3325 18064,6 979569 4,0056 8172,1,21878,11,2489 8172,1,218783,11,2489	\$1,65 68\$1,55 0 328;148 \$5,713328\$1;83 0 7877,837 \$2,62,333\$57;11702 857,854 \$2,526,551,1714 857,854
488,1991	8,897815111,457	8,22,41,218,26,11,248,8	9,525 PES, 11,714 18,822 9,526 PES, 11,714 18,822 9,526 PES, 11,714 18,822 9,526 PES, 11,714 PES (6,822
498,1992	8,397815111,457	8,22,41,218,26,11,248,8	
188,1993	8,397815111,457	8,22,41,218,26,11,248,8	
118,1994	8,397815111,457	8,22,41,218,25,11,248,8	
128,1995	8,397815111,457	8,22,41,218,25,11,248,8	
132,1994 142,1997 152,1998 162,1999 172,2868	6,09781511,457 6,09781511,457 6,09781511,457 3,897815111,457 6,69781511,457	8 t 2 t 1 2 18 2 t 1 1 2 4 0 6 9 t 2 t 1 2 18 2 t 1 1 2 4 0 6 9 t 2 t 1 2 18 2 t 1 1 2 4 0 6 9 t 2 t 1 2 18 2 t 2 1 1 2 4 0 6 9 t 2 t 2 1 2 18 2 t 2 1 1 2 4 0 6 9 t 2 t 2 1 2 18 2 t 5 1 1 2 4 0 6	9,526 560, 1,714 9,19,822 9,526 560, 1,714 9,19,822
187,2861	731,11,218,79,3	8452, 91, 218 258, 11, 240 5	9,526 <sub>26</sub> ,1,714
192,2862	733,11,218,795,8	8452, 91, 218 258, 11, 240 5	
282,2863	733,11,218,795,8	8452, 91, 218 256, 11, 240 5	
212,2864	734,11,218,795,8	8452, 91, 218 256, 11, 240 5	
222,2865	734,11,218,795,8	9452, 91, 218 258, 11, 240 5	
235,2863	754,11,218790,3	8820, 91, 218288, 11, 2498	9,526;58,;1,714
246,2867	754,11,218790,8	8420, 91, 218266, 11, 2498	
255,2868	754,11,218790,8	8420, 91, 218268, 11, 2498	
245,2869	754,11,218790,8	8420, 91, 218268, 11, 2498	
275,2818	754,11,21879,6	8420, 91, 218268, 11, 2498	
285,2811	784,11,218788,8	0 <sub>6</sub> 25, 81,218 <sub>286</sub> , 11,240 <sub>3</sub>	
90570141	884,183784,5918	663, 27, 883320 <sub>858</sub> , 262, 687 <sub>6</sub>	

Table 8.5.2 Internal Rate of Return Calculation Sheet

: :	d.		năără.	Cost	<b>9% B</b> en	188=12.7% efit -15% (Unit	909US\$>
No.	Year	Total	COSTS Construct Op- ion land and Quipment -na	Mainte T	otal : Shi	BENEFITS Ing in Saving in p Wait-Cargo Hand Cost —ling Cost	
3	1984 1985	1,866 4,897	1,666	8		8 3 3 4 8	-1,866 -4,897
3 4 5 6 7	1986 1987 1988 1989 1999	20,148 18,128 11,742 1,035 1,835				282 1,983 1,447 8,897 1,457 8,897	-29,148 -17,838 -8,312 -8,517 -8,517
8 9 18 11 12	1991 1992 1993 1994 1995	1,035 1,835 1,835 1,035 1,035	8 8 8	1,035	9,554 9,554 9,554 9,554 9,554	8,897818,21,457 8,897818,61,457 8,897848,71,457 8,897848,41,457 8,897838,41,457	13 8,519 53 8,519 54 8,519 64 8,519 53 8,519
13 14 15 16	1996 1997 1998 1999 2000	1,035 1,035 1,035 1,035 1,035			9,554 9,554 9,554 9,554 9,554	8,897 18,11,457 8,897 15,11,457 8,897 15,11,457 8,897 15,11,457 8,897 15,11,457	45 8,519 5 8,519 6,519 6,519 6,519
18 19 28 21 22	2881 2882 2883 2884 2885	1,035 1,035 1,035 1,035 1,035 1,035	8		9,554 9,554 9,554 9,554 9,554	8,897 11,457 8,897 11,457 8,897 11,11,457 8,897 11,11,457 8,897 11,11,457	16/8,519 56/8,519 60/8,519 66/8,519 66/8,519
23 24 25 26 27	2006 2007 2008 2009 2010	1,035 1,035 1,035 1,035 1,035	8	1,035	9,554 9,554 9,554 9,554 9,554	8,897318,41,457 8,897318,41,457 8,897318,41,457 8,897318,41,457 8,897318,41,457	5018,519 1018,519 1918,519 1818,519 8118,519
	2811 [012]	i, 035 79,785	54,863	1,835 24,922 2		8,697 <sup>31</sup> 5,11,457 168,499 <sup>12</sup> 1,34,955	#143,669

Table 8.5.3 Internal Rate of Return Calculation Sheet

** Eu = 1 *		in Privatelj		Cóst eżs	lrs	=13.5%	<b>.</b>
		CO\$1	S		enefit - 18% BENEFITS	tunit 's	489US\$)
11,43 - <b>14</b> -3 - 1 <b>5</b> -2 - 4		€ónstruct=	Operation.	. i	aving in Sav	dô in	Net
No. Year	Total	ion and a	ind Hainte	iotal S	hip Hait-Car	go Hand I	Benefit
•		Equipment -	Rance	· i	ng Cost -11	ng Cost	
1 1984	1,866	1,066	9	à		_	
2 1785	4,897			8	8 9	9	-1,866
	- :		-	•	•		-4,897
3 1986	29,148	• .		8		. 6	-20,148
4 1987	18,136		274	299	299	8	-17,838
5 1988 6 1989	11,791		881	3,631	2,180	1,532	-8,168
7 1998	1,096	_		18,116		1,543	9,828
7 : 1770	36.011,898	S 23,7 8	1,698	18,116	8,573	1,543	9,928
8 1991	116 4 1,896	ciña i ai	1 000				
9 1992	1,696		1,896		8,573	. 1,543	7,828
18 1993	1,896		1,896	18,116		1,543	2,928
11 1994	510 11,896	i j			8,573 8,573	1,543	9,028
12 1995	1,896		1,096	. 19,116	8,573	1,543 1,543	9,828
					0,070	11242	9,828
13 1996	1,894	8	1,896	18,116	8,573	1,543	9,928
14 1997	1,896		1,896	19,116	8,573	1,543	9,928
15 1998	1,898		1,896	10,116	8,573	1,543	9,623
16 1999	1,896		1,096			1,543	9,020
17 2888	30 37 1,896	6 <u>6</u>	1,696	18,116	8,573	1,543	7,828
18 2001	4 1 . 8 9 6	San Barra	1 604	10 114	Ġ <b>5</b> 33	1 543	0.000
19 2002	1,894		1,896	18,116	8,573 8,573	1,543 1,543	9,828 9,828
28 2863	1,896		1,896	10,116	8,573	1,543	9,828
218,2884	1,896	8	1,996	18,116	8,573	1,543	9,828
22 2985	1.896		1,896	18,116	8,573	1,543	9,828
				· · · · · · · · · · · · · · · · · · ·	1.5	* * * * * * * * * * * * * * * * * * * *	
23 , 2886	1,896	\$45.4 <b>8</b> .	1,896	10,116	8,573	1,543	9,828
24 2887	1,894	8	1,876	10,116	8,573	1,543	9,828
25 2998	1,894		1,896	10,116	8,573	1,543	9,828
26 2889	1,896		1,096	18,116	8,573	1,543	9,628
27 2018	310 1,896	<b>.</b> 1984	1,896	18,116	8,573	1,543	9,828
28 2811	Atta 1,696	ξτ <u>η</u> ν	1,896	10,116	8,573	1,543	9,028
₹\$ Toţal	s ( 81,251	54,863	26,388	236,598	199,587	37,812	155,347

Table 8.5.4 Internal Rate of Return Calculation Sheet

			e ger	Ċ	ást 8% B	ikk=1 enefit -5% (	
			COSTS			SENEFITS	0
						aving in Savir	ain Net
No.	Year						Hand Benefit
			quipment -n			ng Cost -ling	Cóst
						regionant is half	
1	1984	1,966	1.066	8	. 8	·	6 -1.866
2	1985	4,897	4,897	9	9	9	
		.*	•				12.7
3	1986	28,148	28,148	8	8:	34,40 <b>8</b> 32.	8 -28,148
4	1987	18, 153	17,842	311	315	315	
5	1988	11,848		939			
8	1989	1,157	8	1,157 ·	. 10,678	9,059	1,628 9,521
7	1998	1,157			16,678		1,628 (9,521
	4	•			•		ngantana Ngantana
	1991	1,157			(i), 18,678:		1,628 9,521
9	1992	1,157			18,673		
19	1993	1,157			10,678		1,628 9,521
11	1994	1,157			19,678		1,628 ( 9,521
12	1995	1,157	8 1	1,157	18,678	ዎ,858	1,628 9,521
L .		4 4 4 5 5 5 5	•				
13	1996	1,157			18,678		
14	1997	1,157			18,678		1,628 9,521
15	1998	1,157		1,157			
16	1999	1,157	The same of the sa	1,157		9,058	
17	2888	1,157	8	1,157	16,678	9,656	1,628 9,521
	0004		100	1.6%	والمراجع والأملاء المراجع	والمعتقبة الما	المصافيات المشواف
18	2881	1,157		1,157			
19	2892	1,157		1,157	18,678		
28	2893	1,157		1,157	10,678		
21	2884	1,157		1,157	19,678		
22	2005	1,157	8	1,157	18,678	9,858	1,628 9,521
23	2886	1 (6)	N 1	4 453	10 10 230°	A AFA ()	
24	2997	1,157		1,157	16,678		1,628 9,521
25	2868			1,157	10,678		
26	2889	1,157 1,157		1,157	10,678	9,059 9,059	
27	2818	1,157			18,678	9,050 ·	1,628 9,521
47	2010	2,137	•	1,157	10,678	3 2 0 0 0	1,628 9,521
28	2811	1,157	8	1,157	10,678	9,050	1,628 9,521
	Total	82,717	54,863	27,854	249,743	210,675	39,868 167,826

Table 8,5.5 Internal Rate of Return Calculation Sheet

1997 <u>- 1</u> 886 <u>3</u> 87   1870   1	Cósts C	ost  0% Benefit	188=15.7% 5% (Unit 1888US#)
No. Year Total	Construct- Operation Joh and and Mainte Equipment -nance		
1 1984 1,06 2 1985 4,89		8 9	9 -1,966
3 1786 28,144 4 1767 18,185 5 1788 11,73 6 1789 1,275 7 1798 1,275	5 17,842 343 9 10,918 1,928 9 1,279	6 8 349 349 4,237 2,456 11,882 18,882 11,882 18,892	8 -17,637 1,787 -7,781 1,886 18,523
8 1991 1,27 9 1992 1,27 10 1993 1,27 11 1994 1,27 12 1995 1,27	8 1,279 8 1,279 8 1,279	11,882 18,882 11,882 18,882 11,882 19,882 11,882 18,882	1,880 18,523 1,888 18,523 1,888 18,523 1,888 18,523
13 1996 1,279 14 1997 1,279 15 1998 1,279 16 1999 1,279 17 2000 1,279	8 1,279 9 1,279 8 1,279	11,882 18,882 11,882 18,882 11,882 18,882 11,882 18,882 11,882 18,882	1,800 10,523 1,800 10,523 1,800 10,523 1,800 10,523
18 2001 1,275 19 2002 1,275 20 2003 1,275 21 2004 1,275 22 2005 1,275	8 1,279 8 1,279 8 1,279	11,882 16,682 11,862 16,682 11,882 10,882 11,882 10,682 11,882 10,882	1,800 10,523 1,800 10,523 1,600 10,523
73 2886 1,27 24 2887 1,27 25 2688 1,27 26 2689 1,27 27 2818 1,27	8 1,279 8 1,279 8 1,279	11,882 18,882 11,882 18,882 11,882 18,882 11,882 18,882	1,898 18,523 1,888 18,523 1,880 18,523 1,880 18,523
28 2811	i di kacamatan da kabupatén Pantan. Pada kacamatan	11,802 10,802 276,031 232,851	1,888 18,523

Table 8.5.6 Internal Rate of Relum Cakulation Sheet

	N.		cos		ost 6% 8	énéfit 19%	≓(ở.4% (Uhít ′à08Uŝŧ)
	* •	100	Construct-	and the second of the second	99 11 - B	BENEFITS aving in Say	ing in Net
No.	Year	Total	ion and Equipment	and Mainte	Total S	hip Hait-Car ng Cost -li	go Hand Benefit
1	1984	1,86	6 1,866	8.	. R	er e	0 =1,866
2	1985	4,89			ě	ğ	8 4,897
3	1986	28,14	8 28,148	: a	ล์	ings and	9 - 20,148
	1987	18,29		360	365	365	8 37,837
5	1988	11,98	7 18,919	1,877	4,437	2,556	1,872 -7,548
6		1,34			12,364	18,479	1,885 11,824
	1998	1,34	9 9	1,348	12,354	18,479	1,865
8	1991	1,34	ð	1,346	12,364	18,479	1,885 11,024
9	1992	1,34		1,348	12,364	18,479	1,885 11,024 1,885 11,024
18	1923	1,34	8	1,348	12,364	18,479	1,885 11,824
11	1994	1,34		1,349	12,354	18,479	1,885 11,024
12	1995	1,34	8 8	1,348	12,364	18,479	1,685 11,824
13.	1996	1,34	9 <sup>11</sup> 11 8	1,348	12,364	18,479	1,885 11,024
14	1997	1,34		1,348	12,364	18,479	1,885
15	1998	1,34		1,348	12,364	10,479	1,885 11,824
	1999	1,34		1,348	12,364	19,479	1,885 11,824
17	2888	1,34	8	1,348	12,364	18,479	1,885 11,024
18	2661	1,34	8 8	1,348	12,364	18.479	1,885
19	2882	1,34		1,340	12,364	10,479	1,885
28	2893	1,34	8 8	1,349	12,364	18,477	1,885
51	2304	1,34		1,340	12,364	19,475	1,885 11,824
22	2885	1,34	8	1,348	12,364	18,479	1,885 611,024
23	2886	1,34	a a	1,346	12,364	18,479 · · ·	. 1.865 11.624
24	2887	1,34		1,348	12,364	10,479	
· · ·	2888	1,34		1,348	12,364	18,479	1,885 11,824 1,885 11,824
	2889	1,34		1,348	12,364	10,479	1,885
27	2818	1,34		1,348	12,364	18,479	1,885 11,924
28	2811	1,34	8 9	1,340	12,364	18,479	1,885 111,024
	Tòtal	87,11	5 54,863	32,252	289,176	243,939	45,236 202,861

Table 8.5.7 Internal Rate of Return Calculation Sheet

	4.5							ده. دده شد	1.0
	4					ost 9% 8		R=17.1%	
	:		7275	COST	r <b>Ś</b>	~ 0/1 0	enefit 15% EENEFITS		(*2088)
			100	Construct-	Operation	. s	aving in Sa		Net
No	Yea	<b>የ</b> > 31	Total ::	ion and a	ind flainte	Total S	hic Wait-Ca	ron Hand F	Panafil
	:		A 100	Equipment -	nance	i	ng Cost -1	ing Cost	-energy
		*	- 1 P		2			ing cost	:
1	1984		1,866		: 8	9:	·: 8	: <b>8</b>	-1,866
2	1985	533	4,897	4,897	. 8	2 8	. 8	é	-4 877
٠	مخفو		حدد هم،						
3 4	1986 1987		28,148		8		74 <b>8</b>	8	-23,148
5	1988		18,218	17,842	376	382	382	. 8	~17,836
6	1789	7000	12,036		1,126	4,648	2,683	1,957	-7,39s
7		2 8 g . 5	1,481		1,481	12,926	10,755	1,971	11,525
•	1776	1136	1,481	8	1,481	12,928	18,955	1,971	11,525
8	1991		1,481	à	4.454				
Š	1992	1.19.0	1,491	6	1,481	12,926	10,955	· 1,571	11,525
íè	1993	11.	1,461		1,401	12,926	10,955	1,971	11,525
ii	1994		1,481		1,491	12,928	18,955	1,971	11,525
12	1995		1,461	, -	1,481	12,926	19,955	1,971	11,525
			1,401		1,481	12,926	10,955	: 1,971	11,525
13	1996	1 1	1,481	1 (27.9 <b>a</b>	1,481	12 024	100		2.5
14	1997	1000 第二百分	1,481		1.481	12,926	10,755	1,971	11,525
15	1998		1,481		: 1,481	12,926	18,955	1,971	11,525
16	1999		1,481		1,481	12,526	10,955	1,771	11,525
17	5998	1.50	1,481	Ä	1.401	12,726	10,955	1,971	11,525
		7 35		Salin Mas 🍆	1,791	16,720	10,955	1,971	11,525
18	2881	$\gamma (S_1, S_1, P)$	1,481	9	1,481	12,926	10,955	1,971	ti ése
19	2882		1,481	8	1,461	12,926	10,755	1,971	11,525 11,525
28	2003	1 3 - X	1,481	1	1,481	12,928	10,755	1,971	11,525
21	2884	11	1,481	- 8	1,481	12,926	18,755	1,971	11,525
22	2885	1.0	1,481	8	1,481	12,926	19.955	1.971	11,525
			ે ફેટ્રેસ્	电电弧 化氯甲酚	283.4±	- 100 V G	,	.,,,,,	11,020
23	2886	100	1,481	f 3. 324 5 🔞	1.481	12,926	18,955	1,971	11,525
24	2887		1,491	8	1,481	12,926	18,955	1,971	11,525
25	2888	- ক্ৰ	1,481	8	1.481	12,925	10,955	1,971	11,525
26		. Ti , T	1,481	1 6 6	1,401	12,926	18,955	1,971	11,525
27	2819	4865	1,481	8	1,431	12,926	18,955	1,971	11,525
وش	2	ere e	4.5	en de la companya de La companya de la co				• • • • •	
28	2811		1,481	8	1,401	12,926	18,955	1,971	11,525
		1	3.3		1.47		• • • • • • • • • • • • • • • • • • •		11,020
	Total	12°	88,581	54,863	33,718	382,329	255,628	47,293	213,739
	;				*			• •	
		्रहरू है।	C 7 2 3	.१६ - ५ ५ देश व्हरी	285 114	· 经基础 一点	A second of the second	. :	

Table 8.5.8 Internal Rate of Return Calculation Sheet (Shadow Price)

IRR = 15.8% (Unit: '000US\$)

÷	·		cos	TS		in in the second	BENEFITS		f *
No.	Year	Total	Construc- tion and Equipment	Óperation and Main- ténance	Total	Saving in Ship Waiting Cost	Saving in Cargo Handling Cost	Net Benefit	or Garage
ı	1984	1,002	1,002	0	e o	<b>0</b>		- 1,002	o protie
2	1985	4,603	4,603	. 0	Ċ	i (Ò	0	- 4,603	
3	1986	18,939	18,939	0	- 0	i a a a a a a a a a	0.	. –18,939 -	
4	1987	17.069	16,771	298	332	332	797 S. (6)	-16,737	
Ś	1988	11,145	10,255	891	3,881	2,333	1,548	<b>- 7,265</b> .	
6	1989	1,108	Ó	1,108	11 085	9,526	1,559	9,977	కెక్కి కార్లు శాతక్కించి కెక్కి
7	1980	1,108	Ó	1,108	11,085	9,526	1,559	9,977	
٠.	****	1. A	<b>.</b>	And the second	11,085	9,526	1,559	9,971	ক্রেটির প্রত্
. <b>8</b> 9	1931 1992	1,108 1,108	Ò	1,108 1,108	11,085	9,526	1,559	9,977	
10	1993	1,108	0	1,108	11,085	9,526	1,559	9,977	ក្នុង (១៩៩) ជាជាទូរ ១ និតិ
11	1994	1,108	0	).108	11,085	9,526	1,559	9,977	
12	1995	1,108 1,108	. 0	3,108	13.085	9,526	1,559	9,977	
12			ti (A		- <u>- 1</u>	(+	أوبرائها الما		数等演员 6.7 数字 1. ************************************
13	1996	1,108	0	, 1,108	11,685	9,526	1,559	9,977	5 k7 ( ) - 70 ( ) 7 ( ) 2 ( ) 5 ( )
14	1997	1,108	0	1,103	11 085	9,526	1,359	9,971	
15	1998	1,103	0	1,108	11,085	9,526	1,559	9,977	ត្រូវថ្ងៃ បាន់ដំ
16	1999	1,108	Ó	1,168	11,085	9,526	1,339	9,977	
17	2000	1,108	. 0	1,108	11,085	9,526	1,559	9,977	【印象等(1 記字) (1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
18	2001	1,108	0	1,108	11,085	9,526	1,559	9 977	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
19	2002	1,108	0	1,108	11,685	9,526	1,359	9,977	क्रिकेटिक के हैं
20	2003	1,108	0	1,108	11,085	9,526	1,559	9,977	电电影器 医糖尿
. 23	2004	1,108	0	1,108	11,085	9,526	1,559	9,977	nikwa wika
22	2005	1,108	0	1,108	11,085	9,526	1,559	9,977	
23	2006	1,168	0	1,108	11,085	9,526	1,559	9,977	10 <b>5</b> 6 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7
24	2007	1,108	0	1,108	11,085	9,526	1,559	9977	35.4 4
25	2003	1,108	Ò	1,103	11 085	9,526	1,559	9971	គរ្គៃភ្នំពង់ ទ
26	2009	1,108	, Ó	1,108	11,085	9,526	1,559	9,977	135 365
27	2010	1,108	0	1,108	11,085	9,526	1,559	9,977	****
28	2011	1,108	· · · · · · · · · · · ·	1,108	11,085	9,526	1,559	9,977	្រុងដែលប៉ុន្តិ ប
To	<b>ដៀ</b>	78,243	51,570	26,673	259,168	221,763	37,405	180,925	

Table 8.5.9 Cost Benefit Table (Discount Ratio = 12.0%)

(Unit: '000 US\$) Discount Value (Discount Ratio = 12.0%) No. Year Costs Benefits ı 1984 1,066.00 Ź 1985 4,372.32 3 1986 16,061.86 1987 12,932.33 236.31 1988 7,555.67 2,564.31 6 1989 691.12 6,377.87 7 1990 617.07 5,694.53 8 1991 550.96 5,084.40 ģ 1992 491.92 4,539.64 ŝÓ 1993 439.22 4,053.25 1994 392.16 3,618.97 12 1995 350.14 3,231.23 13 1996 312.63 2,885.02 14 1997 279.13 2,575.91 ŧŠ 1998 249.22 2,299.92 16 1999 222.52 2,053.50 17 2000 198.68 1,833.48 18 2001 177.39 1,637.04 19 2002 158.38 1,461.64 20 2003 141.41 1,305.04 2004 126.26 1,165.21 2005 112.73 1,040.37 23 2006 100.65 928.90 24 2007 89.87 829.37 2008 80.24 740.51 26 2009 71.64 661.17 27 2010 63.97 \$90.33 28 2011 \$7.11 \$27.08 Total 47,962.73 57,935.12

B/C Ratio =  $\frac{57,935.12}{47,962.73} = 1.21$ 

Table 8.5.10 Cost Benefit Table (Shadow Price) (Discount Ratio = 12.0%)

(Unit: '000 US\$)

<u>r</u>		<u> </u>	(Unit: '000 US\$)
No.	Year	Discount Value (D	iscount Ratio = 12.0%)
		Costs	Benefits
1	1984	1,002.00	
- 2	1985	4,109.82	
3	1986	15,098.05	
.4	1987	12,149.37	236.31
<b>5</b> 6	1988	7,083.48	2,466.44
6	1989	628.70	6,289.92
7 :	1990	561.34	5,616.00
<b>8</b>	1991	501.20	5,014.29
9	1992	447.50	4,477.03
10	1993	399.55	3,997.36
11	= 1994	356.74	3,569.07
12	- 1995	318.52	3,186.67
13	1996	284.39	2,845.24
14	1997	253.92	2,540.39
15	1998	226.71	2,268.21
16	1999	202,42	2,025.18
17	2000	180.73	1,808.20
18	2001	161.37	1,614.46
19	2002	144.08	1,441.48
20	2003	128.64	1,287.04
21	2004	114.86	1,149.14
<b>22</b>	2005	102.55	1,026.02
23	2006	91.56	916.09
24	2007	81.75	817.93
25	2008	72.99	730.30
26	2009	65.17	652.05
27	2010	58.19	- 1916 - 582.19
28	2011	51.95	119 519,81 85
	Total	44,877.70	\$7,076.94

B/C Ratio =  $\frac{57,076.94}{44,877.70} = 1.27$ 

্টা হৈছিল কৰা । তেওঁ হৈছিল জন্ম সংগ্ৰহণ কৰিছেই কৈছে ভাৰত শাস্ত্ৰাৰ ইয়া CHAPTER 9. FINANCIAL ANALYSIS

# CHAPTER 9. FINANCIAL ANALYSIS

人名英格兰斯克斯 电电子电子电子 电电子电子 医电子性 医电子性

# 9.1. Purpose and Mehod of Financial Analysis

The purpose of financial analysis is to ascertain the impact of investments under the present project on the condition of financial control by port management bodies or to determine whether financial healthiness can be ensured.

In other words, based on the premise that financial control is carried out by business accounting, under a self-supporting accounting system, this analysis is to analyse the effect of the investments of the project, i.e., the balance of revenue and expenditure, to ascertain the financing situation, and present the problems found and the measures to be taken.

Needless to say, the ascertainment of financial healthiness is possible only when the management is thoroughly aware of the entire state of financial affairs. Therefore, the analysis covers all the financial operations.

The investment effects of this project are analyzed and evaluated by the following two methods:

- (1) Analysis and evaluation of project by financial statements.
  - (2) Analysis and evaluation of project by the DCF method.

#### 9.1.13 Financial Statements and the considerate assemble to the great acceptable, and being the and

In conducting the analysis, Pinancial Statements (Income Statement, Balance Sheet, etc.) will be prepared to ascertain the soundness of financial affairs.

Accordingly, financial analysis of the Port of Dumai will be based on the following premises:

- (1) Its revenue will be calculated based on the current port fariff rates authorized by DGSC.
- (2) Its accounting will be according to the business accounting system.

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- (3) The funds necessary to execute this project are to be raised as follows:
  - i) Domestic currency portion (42.5%): National Development Fund, interest free: 100 mg

ii) Foreign country under the following loans from a foreign country under the following loan conditions:

人名英格兰 医乳腺素

Table 9.1.1 Loan Conditions for Long Term Loans

	Bulk that by the way a control	on there are throughout the field of	٠.
		The Second State of Second Sec	
gill of bostil		ale or 14% to 10 years by the 144 to	i
		The state of the s	
Fr	Term of loan	40 years	

(4) The financial analysis will cover the period from 1984 to 2011.

(5) Depreciation is to be based on the straight line method and the life cycle based on the standard set by the Indonesian Government.

· 1886年 - 1986年 - 東京 1986年 - 1986年 -

Table 9.1.2 Depreciation Rate and Life Cycle by Facilities

Item .	Depreciation Rate	Life Cycle (years)
Quay	0.025	40
Open Storage	0.025	40
Warehouse	0.025	40
Road	<b>0.1</b>	the of the series of the contract of
Office Building	0.025	40
Water Supply	0.2	riu i i kana wake mwaze mwa
Power Supply		#545 (20 # g to 10 <b>10</b> 0 #40 (10 + 5) to 12 #
Navigation Aids	. 1 - 1 <del>1 - 1 - 2 - <b>0.2</b> 2 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -</del>	and the second s
Cargo Handling Equipment	0.15	65
Vessel	0.1	
Bouy	<b>0.2</b>	医克克特氏糖 经推销的

Source: BPP Dumai

#### (6) Surplus funds

After depreciation and payment of interest, 45% of the Net Profit will be deducted for tax and 30.3% for payment to the National Development Fund - (Net profit 100% - Tax 45%) x 55%. The surplus is to be retained as internal reserve.

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# 9.1.2. Financial Rate of Return (FRR) where with proposition for holding a billion account of the

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In evaluating the project by the DCF method, the FRR (financial rate of return) is determined by Formula 8,5,1 in Chapter 8, using the earning increase after the completion of the project as the Benefit and the project construction cost as the Cost.

As stated in the foregoing paragraphs all aspects of the operation of the Port of Dumai will be analysed. The profitability of the project will be judged independently in the analysis. Thus, profit before depreciation and interest payment for the entire port must be calculated for every year. The estimated profit before depreciation and interest payment for the Port of Dumai is regarded as the benefit, and I may proved that the light of Dock 1. If I is wide it

The profit, before depreciation and before interest payment, for each year after 1987 when investment effects begin to appear, is the operating profit, i.e., the benefit.

By using the above method, the financial rate of return (FRR) is calculated on the independent profit system of the Port of Dumai.

#### 9.2. Revenues

9.2.1. Method of estimation and appearance of the state of the property of the p As indicated in the assumptions, the revenue is calculated from the Indonesian Government's set tariff rates, not from special port tariff rates for the Port of Dumai set on the cost basis arising from this project. The current port tariff rates are the new rates set in the revision of Jan. 1983. Dues and charges are composed of the following types.

- 1) Ship Charges:
- (1) Harbour Dues: The unit charge per gross ton was established, and was multiplied by the per annum gross tonnage of entering vessels, classified by type.
- (2) Berthage: The unit charge per gross ton was established, and was multiplied by the per annum gross tonnage and berthing days, for each type of vessel.
- (3) Pilotage: Cumulative computation was made on the basis of the tariff, estimating the number of vessels classified by type and size for each fiscal year.
- (4) Towage: Cumulative computation was made on the basis of the tariff, estimating the number of vessels classified by type and size for each fiscal year.
- (5) Water Supply: Total revenues were estimated from the past business records.
- 2) Cargo and Facilities Charges
- (1) Facilities charge: The unit charge per ton of cargo was established and was multiplied by the volume of cargo passing through the facilities each year. This unit charge includes for wharves, transit sheds and open storage.
- (2) Equipment rental: The unit charge per ton of cargo handled was established and was multiplied by the total volume of cargo to be handled during each year.
- 3) Others: Total revenues were estimated from the past business records.

# 4) Ship and Cargo Utilization of the Port

11.11

The number of ships calling at the port and the volume of cargo handled by the port facilities are set in accordance with the demand forecast in Chapter 5 in Table 9.2.1 and Table 9.2.2. Cargo volume handled at the sheds and open storage is shown in Table 9.2.3.

Table 9.2.1 Number of Ship Calls

543 NA3

Kinds of Ships	Year	1987	1988	1989
	8,000 ~ 10,000 DWT Class	69	88	111
Ships in foreign trade	10,000 ~ 15,000 DWT Class	П	12	13
<u></u>	25,000 ~ 30,000 DWT Class	6	8	10
ing digital and the second	300~ 500 DWT Class	240	255	275
Ships in domestic trade	1,000 ~ 2,300 DWT Class	164	195	229
	5,000 ~ 8,000 DWT Class	67	72	78
Tanker	12,500 ~ 35,000 DWT Class	507	521	535
100201	100,000 DWT Class	520	535	550

Table 9.2.2 Cargo Yolume

Committee Care

Soft no soliti

(Unit: '000t) 1987 1988 1989 Foreign Trade Foreign Trade Domestic Trade Domestic. Foreign Trade Domestic Trade Commodity Tradé In Out Out In Out la Out In Out Öùt 176 Palm Oil 237 102 318 136 411 40 36 Palm Keinel 20 27 **`\$**\$ 29 222 110 Fertilizer 238 254  $\mathcal{F}(\mathcal{F})$ Sawn Timber 91 10 102 11 113 13 Rice 49 40 18 Ŝì. 42 19 9.29 - 54 19 5 44 Rubber 5 200 9 . و ره . 14 114. : ; of Mil 11(1) General Cargo 35 484 35, 16 \_\_19 90 18 35 99 Total 84 36Ż 346 166 86 469 **370** 211-89 591 397 263

Table 9.2.3 Cargo Using Shed and Open Storage

i is or equipment and development of being been

						· · ·	10 40 £ 1- <u></u>	(V	nit: '000 t)
Year		1987			1988	· · · · · · · · · · · · · · · · · · ·	ত । বিজয় <del>িক ব</del> ল্	1989	क्रिकेट हैं क
Commodity	Shed	Open Storage	Total :	Shed	Open , Storage	Total	s ≷ Shéd to	Open Storage	Total
Sawn Timber	1.	101	101	_	113	113		126	126
Fertilizer	204.4		204.4	219.2		219.2	234		234
Rice	64.2	-	64.2	61.6	11.2*	72.8	59.7	17.6*	•
Palm Kernel	49		49	60	7	67	71	18#	89
Rubber	· 5	<b>→</b> ; ; ;	<b>.</b>	9	ي عد و	• 9	14:11		14
General Cargo	121.5	] - ]	121.5	111.6	11.4*	123	105.6	26*	131.6
Total	444.1	101	545.1	461.4	- 142.6	604	484.3	187.6	671.9

\* Container cargo.

#### 9.3. Expenditures

Expenditures may be classified into five categories: personnel costs, general administrative costs, maintenance/operating costs, depreciation expenses and interest on loans. They are to be calculated as follows:

# 1) Personnel Cost

In 1981, the average annual per capita personnel cost for Dumai Port Administration was 1,992 US\$. The average annual per capita personnel cost in 1982 is estimated at 2,111.76 US\$ by adding more than 6% to the 1981 figure.

The present organization and personnel of Dumai Port Administration are in accord with its present facilities and port activities. So, the future number of personnel for the Dumai Port Administration was determined in view of the proposed new facilities and the port demand forecast.

The number of personnel at Dumai Port Administration is shown Table 9.3.1.

ritoria dos empleos delicitar en esta delicada de la comercia del la comercia de la comercia del la comercia de la comercia del la comercia de la comercia del la comercia

1981 1984 1985 1986 1987 1988 1989 Port Administrator Secretariat 65 65 69 69 69 71 ŻÌ Traffic Division 11 17 18 18 19 22 25 ... Service Division 37 40 41 42 43 54 59 Technical Division 1 42 1 45 49 50 52 · 60 62 Finance Division 33 35 36 36 36 39 39 Pilotage Division 118 123 123 125 127 130 130 Fire Brigade 15 15 . 15 . 15 . 15 15 Total 321 340 351

361

389

401

Table 9.3.1 Number of Personnel at Dumai Port Administration

# 2) General Administrative Cost

The general administrative cost of Dumai Port Administration for 1981, was 22% of the personel cost. So, 22% of the personnel cost is used here to estimate the general administrative cost. j a 利定 通讯电影图文 经销售公司 (Add Service Control of Service Control of

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### 3) Maintenance/Operating Cost

The maintenance/operating cost of each facility was estimated, as shown in Table 9.3.2, by setting a maintenance/operation ratio representing a certain proportion of the construction or purchase cost of that facility.

The maintenance/operating cost includes the existing facilities, the 500 m jetty under construction and the tugboats (4), pilot boats (5) and mooring boats (4) to be purchased in 1984 and 1985.

Table 9.3.2 Maintenance and Operating Costs

Facilities	Rates (%)
What	1.0
Revetment	03
Navigation Aids	20
Shed	マール 動物 アン・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・
Building	
Road/Pavement	The state of the body and
Water Supply	(f. fr.) 17 (i.e., grader frage designs from the g
Electric Supply	el de la 17 a registra, <b>3,0</b> a l'écrapagnes de l'
Cargo Handling Equipment	the continue had 10.0 of the actions

The rates of maintenance and operation costs, as shown in Table 9.3.2, were assumed to refer to JICA's reports.

- (1) Report on the Development Project of the Port of Colombo
  The Democratic Socialist Republic of Sri Lanka
  March, 1980
- (2) The Peasibility Study for Kelantan Port Development Project in Malaysia February, 1981
- (3) Final Report for the Study on the Development Project of the Port of Sorong
  The Republic of Indonesia
  May, 1981
- (4) The Peasibility Study on the Second Stage Expansion Project of the Port of Caldera Republic of Costa Rica

  December, 1981
- (5) The Study on the Development Project of the Port of Irene
  Republic of the Philippines Philippine Ports Authority
  March, 1982

The rates of maintenance and operation costs by the UNCTD published, Port Development: a handbook for planners in developing countries, are also shown in Tables 9.3.3 and 9.3.4.

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Table 9.3.3 Maintenance Costs for Structural Elements: Values Adopted for Estimating Purposes

	Class of structure and type	Annual average maintenance costs as a percentage of current new cost or replacement value
	Quay structures	
	Steel sheet piling	0.30
	Steel piling with reinforced concrete deck	1.00
ing for Garage	Reinforced concrete piles and deck	0.75
	Rubber fendering	1.00
	Embankments	"在我们的,""是一个女人的女人。" "我们的我们的我们的我们的我们的我们的我们的我们的我们的我们的我们的我们就是我们的我们的我们就是我们的我们就是我们的我们就是我们的我们就是我们的我们就是我们的我
1	Rockfill	0.75
	Surfacing	
	Concrete aprons or roads	1.00
	Asphalt	1.50
	Other surfaces (grave), etc.)	7.50
	Breakwater	2.00

Table 9.3.4 Maintenance Cost for Mobile Equipment: Values Adopted for Estimating Purposes

Type of equipment	Annual maintenanc cost (1973), as a percentage of purch price
ontainer crane	5
3/5-ton quay crane (rail-mounted)	5
Mobile crane (10 tons at 20 m)	8
Mobile crane (25 tons at 25 m)	10
Straddle carrier	12
Fork-lift truck (20-ton)	8
Fork-lift truck (5-ton)	14
Road tractor	10
Trailer	3

Source: Paper on "Problems de manufention portuaire", presented by CERLIC (Centre d'Etudes et de Recherches de Logistique Industrielle et Commerciale) to the second UNCTAD/SIDA Port Training Course held at Algiers in 1973.

#### 4) Depreciation

The amount of depreciation is computed cumulatively, based on the depreciation rate and the life cycle (Table 9.1.2). With regard to the fixed assets of existing facilities, actual investments after 1982 are cumulatively computed for each facility and added to the figures from the table of fixed assets as of the end of 1981 prepared by Dumai Port Administration.

This computation includes the 500 m jetty under construction and the tugboats (4), pilot boats (5) and mooring boats (4) to be purchased in 1984 and 1985.

The average service life for this project is 23 years, ending in 2011. The fixed assets schedule is presented in Table 9.3.5.

#### 5) Interest on Long Term Loans

This is calculated, as shown in Table 9.3.6, on the assumption that the foreign currency portion of the project cost will be met by the above-mentioned foreign loans.

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- And Andrew State Andrew Angres (Angres Angres An

Table 9.3.5 Fixed Assets Schedule

		_		The state of the s		Market Shannanda Carlo		一年 日本	The second second second	THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.				
			Tabl	Table 9.3.5	Fixed /	Fixed Assets Schedule	chedule			- 1 (1985年) - 第1 (1985年) - 第1 (1985年)	en de Parasi A Tabaran	ng king ta Mala Kabupatèn		orani ili. Madanasi
	- - -									f		,	(Unit	*0000SS
Tean Company	(1983)	7861	1985	1986	1987	1988 1989	1989	1990	7661	1992	1993	1998 1998	2003 2003	2004 7
Fixed Assets at Beginning Year		17.500	22,178.	30.687	50.023	868.998	76.530	73.248	69 986	66. 724	63. 642	60 200	V08 27	27 580
Non-Depreciable Assets (land)		78	78	8	8	84.	ã	033	033	1	1	1,033	₹ 0 2 2	
Depreciable Assets	Ţ	19,594	-24,273	28,952	30,431	34,390	35.46	79.302	79,302	79.302	79.30	79.302	78.32	75.75
Depreciation		3,637	4724	. 5,860	966.0	3	9,825	13,087	16.349	19.61	22,873	26,135	42 645	58.755
Written down value	-	15,937	19,549	23.032	23, 435	26,060	2,22	66.215	62,953	59,691	56.429	53,167	36, 857	20.547
Construction in Process	100	4,5 679	2, 545	7,511	26.304	40.754	\$1.105			4		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
\ <b>∀⊕≠</b> 520 <b>₽</b> 21	-	57/5	9.645	20,472	18, 209	11.107								
Extering Fachlythes		669.7	6/0.7											
NAV MACHINGLAS	₩ .*** .**	7-090-7	996.7	20,472	18,209	11.107	2.1 2.1			1.				
Non-Depreciable Assets	Mil.		A A		ī,		670 9	-						
Depreciable Assets	1	4.679	6.679	1.479	3,959	756	75. 77							
Construction in Process	-	2,545	6,445	20.472	18,209	11,107						<del></del>	-	
Daprechation	1 - 7	1,067	1,136	1.136	1.334	1.495	3.262	3.262	3 262	3 262	3 262	14 310	16 370 1	27 \$ 06
axed Assets at End of Year	17,560	22, 178	30,687	50,023	R68.99	76.310	73.248	985.69	66 724	63 462	60 200	00K 67	27 580	7 033
Non-Depreciable Assets (land)	78	78	78	78	7,8	78	7 033	7 633	7 033	7 033	7 633	7,033	7 033	7 033
Depresiable Assets	19,594	24,273	28,932	30,431	34.390	35,146	79.302	79.302	79 302	79 302	79.302	79 302	79,302	70.702
Deprechation	3,637	4.724	5,860	6.996	8,330	9,825	13.087	16.349	19 6.1	22 873	26,135	42.445	58 755	79 302
Whiteen down value	15,937	19,549	23,092	_	26.060	25.321	66, 215		59.691	56 429	53.167	36.857	20,547	0
Construction in Process	1.479	2,565	7.511	26.504	40.754	\$1.105								•

Table 9.3.6 Long Term Loans Schedule

(Unit: '000 US\$)

		Project Cost				
Year	National Development Fund	Long Term Loan	Total	Loan Repayment Amount	Lean Balance at End	Interest on Loan
1984	376	690	1,066		690	24
1985	1,704	3,262	4,966		3,952	138
1986	7,908	12,564	20,472	47.04	16,516	578
1987	8,950	9,259	18,209		25,775	902
1988	4,803	6,304	11,107		32,079	1,123
1989					32,079	1,123
1990			1 3 名称		32,079	1,123
1991	j			i ingress	32,079	1,123
1992					32,079	1,123
1993					32,079	1,123
1994				1,069	31,010	1,085
1995	·	· :		1,069	29,941	1,048
1996	}			1,069	28,872	1,011
1997				1,069	27,803	973 💥
1998			<b>一般</b> 医斯勒斯氏管	1,069	26,734	. 936
1999				1,069	25,665	898
2000				1,069	24,596	861
2001	[			1,069	23,527	826
2002				1,069	22,458	786
2003	{	ľ	[[] [[] 医环烷基	1,069	21,389	749
2004				1,069	20,326	711
2005	}		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1,069	19,251	674
2006	1	Į	1. 第四周 第	1,069	18,182	636
2007	J			1,069	17,113	599
2008	,			1,069	16,044	562
2009	]			1,069	14,975	524
2010	į.	Ì		1,069	13,906	487
2011			111100000克阿莉	1,069	12,837	449

# 9.4. Pinancial Situation

Financial statements for 1984 to 2011 were prepared according to the above estimate of revenues and expenditures. Table 9.4.1 is an income statement, Table 9.4.2 is a statement of sources and applications of funds and Table 9.4.3 is a balance sheet.

The income statement shows that the operating revenue is sufficient to cover the operating expenditure. The balance of revenues and expenditures and the earning position shown by Table 9.4.1 are extremely favorable in that a relatively large amount can be set aside each year for internal reserve.

The statement of sources and applications of funds shows the cash flow after the execution of the project, in order to ascertain the long term debt or the repayment schedule of the loans.

# 9.4.1. Evaluation by Financial Statements

A financial ratio analysis was made as to the soundness of the financial affairs of the port management body, using figures from the three financial statements (Table 9.4.1, 9.4.2 and 9.4.3). In this case, the financial statements cover all aspects of the Dumai Port Administration. As for the period to be analyzed, since management is expected to be stabilized during the period from 1994 to 1998, annual averages for that period are to be used. Needless to say, the ascertainment of financial healthiness is possible only when the management ascertains the entire state of financial affairs, and then presents them as the object of analysis.

1) Financial Ratios Used for Analysis	
The following five financial ratios are to be used	for analysis.
(1) Working Ratio to ascertain the income p	osition
Operating expenditure	
Operating revenue x 100	
(2) Operating Ratio to ascertain the income	position
Total operating expenses × 100	
Total operating revenues × 100	
(3) Return on Net Fixed Assets to ascertain	the earning capacity
Profit after depreciation	
Net fixed assets at end of year × 100	
(4) Interest Earned Ratio to ascertain intere	st payment capacity
Profit after depreciation	
Interest on long term loans × 100	
(5) Debt Service Coverage to ascertain toan	repayment capacity
Operating profit	
Repayment and interest on long term loans	× 100

2) Evaluation of Financial Ratios

For the linancial ratios, average figures taken from Financial Statements (Table 9.4.1, 9.4.2 and 9.4.3) are listed below.

Table 9.4.1 Income Statement

								•	110	( )			(Unit:	,000008\$)
Year	(1983)	1984	1985	1986	1987	1988	1989	1990	1661	7992 <u> </u>	1993	1994 V 1998	1999 ∿ 2003	2004 ∿ 2011
Operating Revenue Operating Expenditure Operating Profit Depratiation Interest on Loan	7,373 3,421 3,952 710	7,631 3,684 3,947 1,067	7,997 3,947 4,050 1,136	8,389 3,958 4,431 1,136 578	8,803 3,978 4,825 1,334 1,334	9,327 6,204 5,123 1,495 1,123	9,876 4,409 3,467 1,123	9,876 4,409 5,467 3,262 1,123	9,876 4,409 5,467 3,262 1,123	9,876 4,409 5,467 3,262 1,123	7,876 4,409 5,467 3,262 1,123	22,045 27,335 27,335 16,310 5,053	49,380 22,045 27,335 16,310	79,008 35,272 43,736 20,547
Profic after Depreciation and Interest on Loan Tax National Development	3,242	2,856	2,776	2,717	2,589	2,505	1,082	°ada aj	1.082	1,082	<del>.</del>	2,687	6,905	18,547
Must Reserve Net Profit Acumulated Net Profit	283 802 7	707	840 687	672	783	758 620	268	327	268	327	327	1,478	1,709	5,611
100 100 100 100 100 100 100 100 100 100			• [	- 	3 J## 24 J 2	is this is			<b>غُر</b> د دور د و		100 e. 2011 (2014)			jota se sas
Errore Sames Marie Marie		aole	7.4.V	Statement	06 10 1	or source and		Application of					(Onic:	.000us\$)
Xear X	(1983)	1984	1985	1986	1987	1,988	1989	1990	1991	1992	1993	1994 v 1998	1999 ℃ 2003	2004 ~
Source of Funds (A) Net Profit Depreciation Long term Loan National Development Fund	802 710 710 2 991	707 1,067 5,053 13,053	687 3,262 6,383	672 2.564 2.564 7.908 7.908	9 259 2 259 2 259 2 259 2 259	620 1,495 6,304 4,803	3,262	3,262	262	268	3,262	1,478	1,709	20,547
Application of Punds (B) Coet of Fixed Assets Addition Repayment of Long term Loans Total	1	<b></b>	3,9	Ī		11,107	idioi (t) 138. II	1 3 1 1 1 1 1 3 1 1 1 1 1 1 1 1 1 1 1 1		i ji se	1000 1000 3100 1000 100 100 1000 100 100	345	57 S	പ മറമാ
Decrease/Increase of Net-Current Assets (C) (C-A-A-B) Ast-Current Assets at Begining Of Year (C-A-A-B) Ast-Current Assets a End of Year	1,512 5,028 5,540	2,540	1,823 4,314 6,137	1.808 6.137 7.945	7.945	2, 713	3,530 12,035 15,365	3,536 15,565 19,095	3,530 119,095	3,530 22,625 26,135	3,530	12,443, 112 23,685,42 22,128,54	. 67. 88. 28.	85,0 42,0 45,0 88,0 20,0 48,4 18,1 18,1 18,1

: .	(\$ SID 000).	2004 ~ 2011	7,033 7,033 71,387 78,420	46,051 12,837 19,532 78,420	
in and their persymptome in the time	(onie:	2003 ℃	27,580 7,033 20,527 54,802 82,382	21,389 11,942 32,382	
And the second s	:   	1994 ~ 1998	43,890 7,033 36,857 42,128 86,018	46,051 26,734 13,233 86,018	
N) My charter		1993	60,200 7,033 53,167 29,685 89,885	46,051 32,079 11,755 89,885	
E F		1992	63,462 7,033 56,429 26,155 89,617	46.051 32,079 11,487 89,617	
an New Table	St≨itset Silvia	1661	66,724, 7,033 59,691, 22,625	46,051 32,079 11,219 89,349	Profession of the second of th
41 - (d) 3 - 2003		1990	69,986 7,033 62,953 19,095 89,081	46,051 32,079 10,951 89,081	
Sheet		1989	73,248 7,033 66,215 15,565 88,813	46,051 32,079 10,683 88,813	連集 からない Annual Common Annual
Ballance S	1955-316 1932-5 1888-50	1988	76,510 84, 25,321 21,105 12,035 88,545	46,051 32,079 10,415 88,545	<ul> <li>Mindred Community of the Co</li></ul>
φ. ε.		1987	66,898, 26,060, 40,735, 75,818,	41,248 25,775 9,795 76,818	
Table 9		1986	20,023 84,25 23,435 26,564 7,965 57,968	32,298 16,516 9,154 57,968	in Agent Charles and a sign of the contract of
ीर अर्थ	⊁ Nego	1.985	25 58 25 687 7 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	24, 390 3, 952 8, 482 36, 824	a esta en francia de la companya de La companya de la co
-		7861	22,178 84 19,549 2,549 26,492		in the first of the second of
		(1983)	17,500 115,937 11,479 20,040	12,952 7.088 20.040	
15.1.9.1	eda rok		(	dinment our Pund)	e Proposition (1985) and Proposition (1985) and the contract of the contract o
		Icem	Scieb Ste A Crion And As	Toon by the Control of the Control o	and the standard of the standa

Table 9.4.4 Financial Ratios (%)

Financial Ratios	1989	1994~1998
(1) Working Ratio	45	45
(2) Operating Ratio	89	88
(3) Return on Net Fixed Assets	3	
(4) Interest Earned Ratio	196	218
(5) Debt Service Coverage	407	263
	3 4 7 3 3 7	

#### (1) Working Ratio

The working ratio is very good compared with those of the ports in European and American countries (including Australia), performing business accounting.

### (2) Operating Ratio

This, like the working ratio is a very favorable value. That both ratios are so favorable is accounted for mainly by the large revenue from tankers and the absence of large maintenance costs as, for example, for dredging.

#### (3) Return on Net Fixed Assets

This also is very good when compared with the ports in European and American countries. Notwithstanding the fact that the net fixed assets coming from the new investment account for an overwhelming proportion, it is noteworthy that the earning capacity taken as a whole is as high as this.

# (4) Interest Earned Ratio

The high value of this ratio shows the high capability of this port for handling the interest charges.

# (5) Debt Service Coverage

The high value of this ratio shows that there will be no problem in repaying the loans. One of the principle reasons is the above mentioned high revenue.

# 9.4.2. Evaluation by FRR

The result obtained for the FRR is 8.9% (Table 9.4.5). We considered it desirable that the FRR remains above the level of the interest rate. Supposing an interest rate of 3.5% for the foreign currency loan portion of the investment funds, and interest free National Development Funds, for the local currency portion;

(Investment funds) foreign currency portion, 57.3%

Local currency portion, 42.5%

Loan interest: foreign currency portion, 3.5%; local currency portion, interest

free National Development Funds

Over all interest rate:

3.5 x 57.5% = 2.0 (%)

Thus, the FRR is well above the interest rate, showing the financial possibility of this project. The sensitivity analyses for unexpected changes in operating revenue yield:

Case A: The case where operating revenue decreases by 15%

FRR: 5.2% (Table 9.4.6)

Case B: The case where operating revenue decreases by 25%

FRR: 2.4% (Table 9.4.7)

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Even should the revenue fall 25% below present estimates the FRR, at 2.4%, is still above the interest rate.

# 9.4.3. Conclusion

2.4

As shown by the foregoing financial ratios, based on data from the three financial statements (Tables 9.4.1, 9.4.2 and 9.4.3), and the FRR, there is no problem in balancing revenues and expenses or in fund raising. That is, with the new investment executed, the financial healthiness of the port is easily secured and financial viability clearly demonstrated.

Table 9.4.5 Financial Rate of Return Calculation Sheet FRR # 8.90%

。 《《《红花》:"我们是我们的一种是我们的一种是我们的一种,我们们就是我们的一种的一种的一种的一种的一种的一种,我们们就是我们的一种,我们们就是我们的一种,我们们

(Unit: '000 USS)

		J		· · · · · · · · · · · · · · · · · · ·	(Unit: '000 US\$
			Balance	in a depth arthur, y this	Discounted
	Year	Project Cost (C)	Operating Profit (B)	( <b>6</b> -c) 18	Yalue (B - C)
1	1984	1,066		- 1,066	1,066
2	1985	4,966		- 4,966	4,560
3	1986	20,472		-20,472	-17,260
. 4	1987	18,209	4,825	~13,384	-10,361
5	1988	11,107	5,123	5,984	4,254
6	1989		5,467	5,467	3,568
7	1990		5,467	5,467	3,276
8	1991	Contract to the	5,467	5,467	3,009 ii t
9 .	1992	l de la segui	5,467	5,467	2,763
10	1993	·	5,467	5,467	2,537
11	1994		5,467	5,467	2,329
12	1995		5,467	5,467	2,139
13	1996		5,467	5,467	1,964
14	1997		5,467	5,467	1,803
15	1998		5,467	5,467	1,656
16	1999		5,467	5,467	1,520
17	2000		5,467	5,467	1,396
18	2001		5,467	5,467	1,281
19	2002	·	5,467	5,467	1,177
20	2003		5,467	5,467	1,031
21	2004	: 1	5,467	5,467	992
22	2005		5,467	5,467	911
23	2006		5,467	5,467	837
24	2007		5,467	5,467	768
25	2008		5,467	5,467	705
26	2009		5,467	5,467	648
27	2010		5,467	5,467	595
28	2011		5,467	5,467	546
7	otal	55,820	135,689	79,869	O

Table 9.4.6 Financial Rate of Return Cakulation Sheet FRR = 5.22%

figure G	1984			<u>-11_1</u>	Discounted					
		* .	1	Project Cost (C)	. :	Op	erating Profit (B)	(B - C)	Value (B - C)	
		;· ]		1,066				1,066	- 1,066	
2	1985	]		4,966				- 4,966	- 4,719	
3	1986			20,472				-20,472	-18,487	
475.	1987	- 1	}	18,209			3,505	-14,704	-12,619	
5 32	1988	1	ł	11,107			3,724	- 7,383	- 6,021	
6 ::	1989						3,986	3,986	3,089	
7	1990	3.			÷	٠.	3,986	3,986	2,936	
8	1991	1.1			1		3,986	3,986	2,790	
9	1992	٠.			1		3,986	3,986	2,651	
10 11	1993	7.5	] .		1		3,986	3,986	2,519	
11:35	1994	14	[ : :		1.5	4 1	3,986	3,986	2,394	
12 .	1995	*			4		3,986	3,986	2,275	
135".	1996	ا . نسب	(			+ %	3,986	3,986	2,162	
14 %	1997	1	1		1		3,986	3,985	2,055	
15 14.	1998	'	•		- 2		3,986	3,986	1,953	
16	1999						3,986	3,986	1,855	
17 [3]	2000	s .	]			-	3,986	3,986	1,763	
18	2001	20					3,986	3,986	1,676	
19	2002	÷				·	3,986	3,986	1,592	
20 : 6	2003	-:			٠.		3,986	3,986	1,513	
21	2004	`*.	1	•			3,986	3,986	1,438	
22	2005	•	1	•	7	٠.	3,986	3,986	1,366	
23年。	2006	43	[		İ		3,986	3,986	1,299	
24	2007	Fil		-			3,986	3,986	1,234	
25	2008	7.	÷	:			3,986	3,986	1,173	
26	2009	1				:	3,986	3,986	1,114	
27	2010			:			3,986	3,986	1,059	
28	2011	-			- 7		3,986	3,986	1,006	
Total	· · · · ·			55,820		-	98,907	43,087	0	

Operating Revenue -15% Cost 0%

Table 9.4.7 Financial Rate of Return Calculation Sheet FRR = 2.44%

(Unit: '000 US\$)

Year			Balance								Discounted	
		7 1		Project Cost (C)	1	Operating Profit (B)			(B - C)		Value (B - C)	
1	1984	-		1,066				+: 1	- 1,066		- 1,066	
2: :[	1985			4,966				ì	- 4,966	= 1	- 4,849	
3.	1986	2.5	5	20,472				3.5	-20,472		-19,507	
4	1987			18,209		. 1	2,624	54.	-15,585	<b>4</b> 2	-14,496	
5	1988	67	-	11,107	1.	;	2,791	(45	- 8,316	ζ.	- 7,551	
6	1989	.43			JA N		2,998	:	2,998	10	2,657	
7	1990	.*.		\$ .	2,	<u>.</u>	2,998		2,998	9,31	2,594	
8	1991	4.1	-	•	· -		2,998		2,998	1	2,532	
9355	1992				1,=	. ,	2,998		2,998	<u> </u>	2,472	
10	1993	į.	1	:	`	1.5	2,998	:	2,998	i -	2,413	
11:15	1994		1				2,998		2,998	5	2,355	
12	1995		100			¢	2,998	ļ	2,998		2,299	
13	1996		7	• • •	44	j.	2,998	.	2,998		2,244	
14	1997	-i	1				2,998		2,998	¥ 4	2,191	
:15 ⊕ j [	1998		1.	1	i r	1.5	2,998		2,998	9.0	2,138	
16 24 1	1999	: 1,			0.5	1. j.	2,998	:	2,998	()	2,087	
17	2000				1,1	1.4	2,998		2,998	2 Y	2,038	
18	2001	5:1		i		11.4	2,998		2,998	Į.,	1,989	
19	2002	Ì.				٠,,	2,998	- 1	2,998	<b>S</b> (	1,942	
20	2003	33	;	•	]		2,998		2,998	) i .	1,895	
21	2004		•	i	٠.:		2,998	1	2,998	· .	1,850	
22	2005						2,998		2,998	. [	1,806	
23	2006	, p	,	e e	37	2	2,998	:	2,998	7	1,763	
24	2007	7		į	. ,	4	2,998		2,998		1,721	
25	2008						2,998		2,998	, g	1,680	
26	2009		į.	3	:		2,998		2,998	٠ د ج	1,640	
27	2010					i i	2,998		2,998		1,601	
28	2011	١ .			, :-	Į.	2,998		2,998		1,563	
Tot	al			55,820			74,369	2	18,549		1. to j = 1	

Operating Revenue -25%
Cost 0%

30년 (2년 전략)

· 自由环络多种运动器

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