

# Report on Rosario Acero S.A.: Managing Capital Structure

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## Preface

Rosario Acero S.A. is considering IPO and hybrid-debt issue in order to pay the principal for the credit line and refinance part of their long-term debt.

In this paper we would quest for the answers for two main issues: the first one is associated with the IPO-debt choice. Given the solution for the first issues we will define an optimum debt-to-equity ratio.

## IPO vs. Debt

At the first stage we need to find out whether IPO or debt financing is the best financing policy for Rosario shareholders. In order to answer the question we will perform Rosario valuation (see Appendix 1-2 for details) under different financing scenario using the following assumptions

Valuation assumption	
Growth rate	3,00%
Beta unleveraged	0,93
Equity Risk Premium	5,00%
Risk Free Rate	6,55%
CRP	1,61%

### Notes

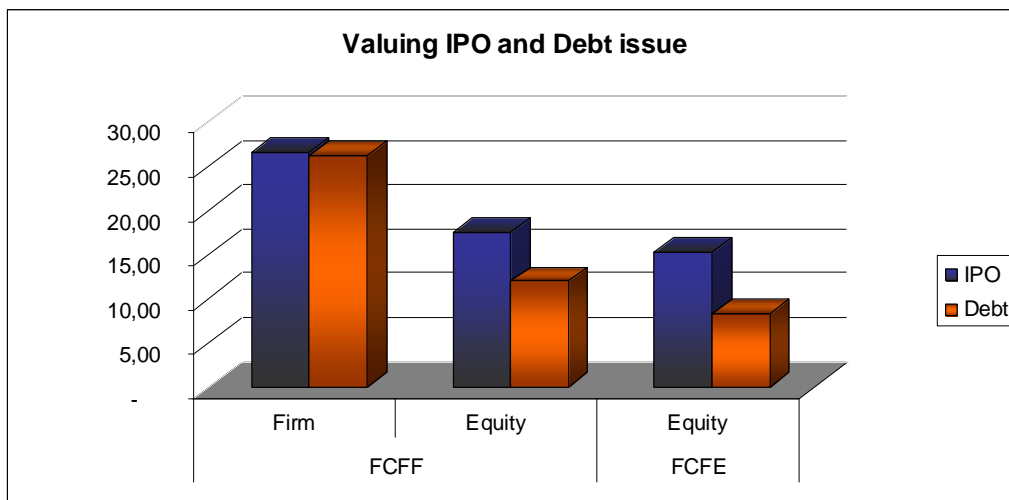
**Growth rate** shows a long-term world economy growth pattern.

**Beta** is taken is average from peer companies: AD, CSA, GA. Other two companies are considered as non-comparable (non-comps).

**Equity Risk Premium** – 5,00 %

**Risk free rate** – UST 10 5 years Moving Average (4:1992-4:1996)

**CRP** – is the difference between current YTM (March 1996) Argentina T-notes 10 years and Current YTM UST 10



Our analysis suggests that company value is almost invariant to the financing decision. While if we look at the shareholder value we will find out that debt financing means much lower shareholder value. This implies redistribution of company value from shareholders to creditors. Given that, ***IPO is more preferable*** for shareholders.

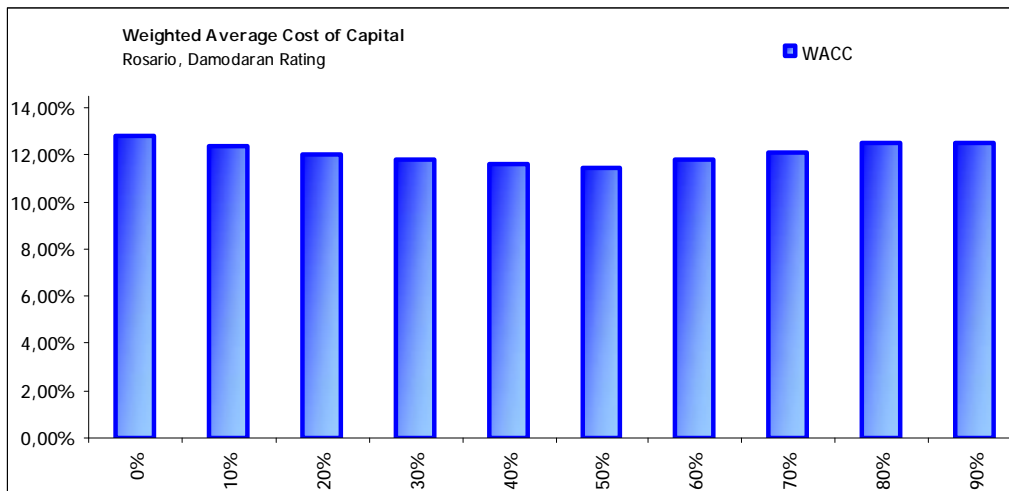
However, there's a subtle issue concerning value distribution among existing and new shareholders: IPO

## Optimal Debt ratio Choice

In this section we would find optimum debt-to-equity ratio for Rosario given their IPO choice. We would use three main approaches: WACC, APV and Operation Income approaches.

### WACC

Using Damodaran's rating based on EBIT/Interest coverage we estimate WACC for different D/E levels. Our analysis shows that the optimum D/E equals 50% with 11,47% WACC (current – 11,82%). But 40% D/E gives almost the same WACC equal to 11,67%. (See Appendix 3)

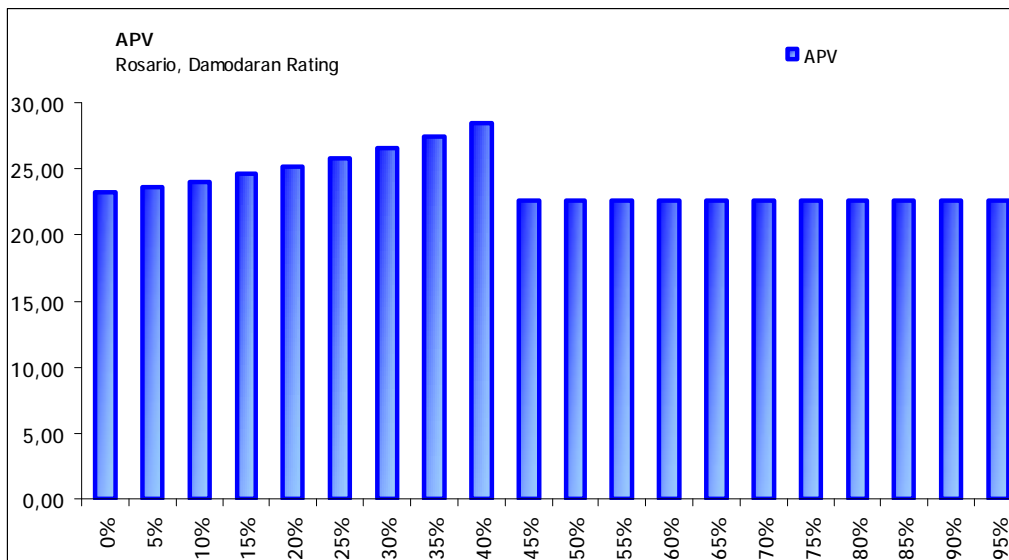


This numbers suggest to take ***40% D/E as optimum*** (50% D/E means more risk in comparison with the benefits of smaller WACC). However, in practice the current 35,86% D/E level may be found suboptimum due to existence of recapitalization costs (Fisher, 1999, Goldstein, 2001).

<b>RESULTS FROM ANALYSIS</b>			
	<i>Current</i>	<i>Optimal</i>	<i>Change</i>
D/(D+E) Ratio =	35,86%	50,00%	14,14%
D/E Ratio	55,91%	100,00%	44,09%
Beta for the Stock unlev. =	1,28	1,55	0,27
Cost of Equity =	14,55%	15,91%	1,36%
AT Interest Rate on Debt =	10,50%	10,66%	0,16%
AT Interest Rate on Debt =	6,93%	7,03%	0,10%
WACC	11,82%	11,47%	-0,35%
Market Value of Firm (C) =	27,33	28,16	0,82
Market Value of Firm (G) =	27,33	29,06	1,73
Market Price/share (C) =	16,44	17,22	0,77
Market Price/share (G) =	16,44	18,06	1,62

### Adjusted Present Value

In estimating APV we used probabilities from Damodaran. Our analysis strongly suggests that company should take no more than 40% of D/E, because more debt leads to company inability to pay interest (EBIT/ Interest < 1, see Appendix 4).



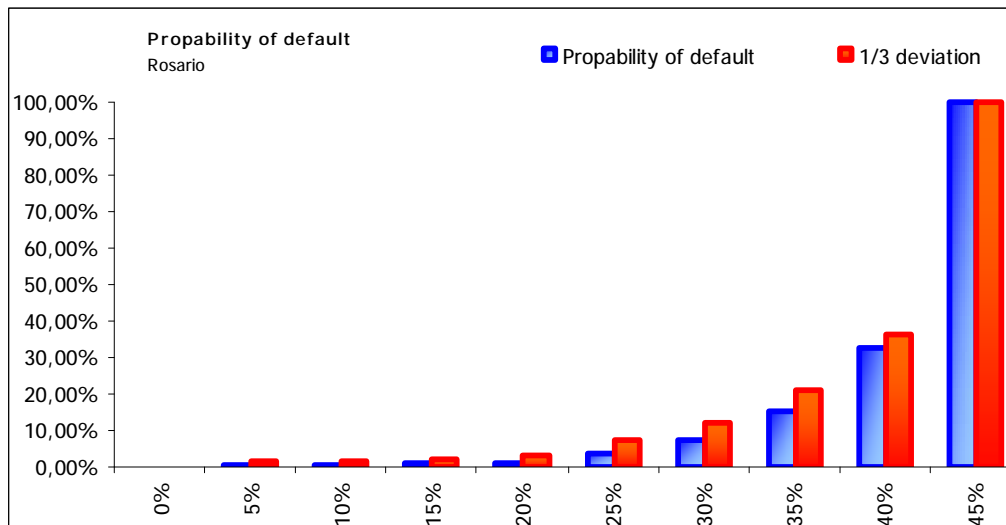
Analysis show that company show take **35,86% (current level) or 40%** D/E, because the difference in value is not significant.

## Operation Income Approach

In this approach we used the following assumptions, estimated on 1996-2002 data. We believe that they give a much more precise estimates of future operating income, than data taken from past.(See Appendix 5)

	1996-2002
Average EBIT	4,29
St.Deviation of EBIT	0,89
St.Deviation of EBIT, %	20,72%
Average Interest	0,51
St.Deviation of Interest	0,34
St.Deviation of Interest, %	66,22%

Using standard deviation of EBIT equal 20,72% we get the probability distribution shown in the following figure. We also compute probability distribution for 33,34% EBIT standard deviation in order to asses the senility of the analysis.



It follows from the graph that 40% D/E ratio is associated with 33% and 36% probability of default (20,72% and 33,34% standard deviation). 35% D/E ratio is leading to a much moderate probability of default – 15,21% and 20,94%.

## **Conclusion**

Based on the analysis of the three methods we think that first of all IPO is more preferable than debt financing scenario. And after the IPO is done there's no evidence that capital structure is deviating heavily from the optimum 40%. The final choice is to be made after analysis of all benefits and costs.

## Appendix 1

### IPO Valuation

	Actual			Projected			
	1996	1997	1998	1999	2000	2001	2002
<b>Income Statement</b>							
Revenues	34,80	38,38	42,34	46,70	51,51	56,81	62,67
COGS	(27,65)	(29,94)	(33,02)	(36,43)	(40,18)	(44,32)	(48,88)
Selling, gen. & admin.	(3,96)	(4,99)	(5,50)	(6,07)	(6,70)	(7,39)	(8,15)
EBIT	3,19	3,45	3,82	4,20	4,63	5,10	5,64
Interst (old loans)	(1,10)	(0,68)	(0,60)	(0,50)	(0,37)	(0,23)	(0,07)
Interest (new loan @ 13%)	0,00	0,00	0,00	0,00	0,00	0,00	0,00
EBT	2,09	2,77	3,22	3,70	4,26	4,87	5,57
Taxes	0,00	(0,94)	(1,09)	(1,26)	(1,45)	(1,66)	(1,89)
EAT	2,09	1,83	2,13	2,44	2,81	3,21	3,68
EAT with extraord. Item	1,76						
EPS (in dollars)	7,55	17,14	19,93	22,90	26,37	30,14	34,48

Note. All the figures are in millions of dollars, except EPS, which is nominated in dollars

### FCFF

	Projected						
	1997	1998	1999	2000	2001	2002	2003
<b>FCFF</b>	1,19	1,01	1,11	1,21	1,34	1,48	3,72
EBIT(1-T)	2,28	2,52	2,77	3,06	3,37	3,72	3,72
CapEx	(1,72)	(1,90)	(2,09)	(2,31)	(2,55)	(2,81)	(1,68)
Amortization	1,03	1,14	1,26	1,38	1,53	1,68	1,68
Changes in NWC	(0,39)	(0,75)	(0,83)	(0,91)	(1,01)	(1,11)	0,00

WACC	11,82%
growth rate	3,00%
Terminal Value (2003)	42,21
Discounted TV	21,60
% of TV in overall value	81,3%
<b>Firm Value</b>	<b>26,57</b>
<b>Equity Value</b>	<b>17,53</b>
Price of Equity	<b>16,44</b>

FCFE

	Projected						
	1997	1998	1999	2000	2001	2002	2003
<b>FCFE</b>	0,36	0,07	0,19	0,31	0,46	0,63	3,68
EAT	1,83	2,13	2,44	2,81	3,21	3,68	3,68
CapEx	(1,72)	(1,90)	(2,09)	(2,31)	(2,55)	(2,81)	(1,68)
Amortization	1,03	1,14	1,26	1,38	1,53	1,68	1,68
Changes in NWC	(0,39)	(0,75)	(0,83)	(0,91)	(1,01)	(1,11)	0,00
Changes in Loans	(0,39)	(0,54)	(0,59)	(0,66)	(0,73)	(0,80)	
Θ (Debt to Capital)	35,86%						
Ke	14,55%						
growth rate	3,00%						
Terminal Value (2002)	31,83						
Discounted TV	14,09						
% of TV in overall value	92,26%						
<b>Equity Value</b>	<b>15,27</b>						
Price of Equity	15,0						

## Appendix 2

### Debt Financing Scenario Valuation

#### The Privately-Placed Debt-and-Warrants Issue

	Actual			Projected			
	1996	1997	1998	1999	2000	2001	2002
<b>Income Statement</b>							
Revenues	34,80	38,38	42,34	46,70	51,51	56,81	62,67
COGS	(27,65)	(29,94)	(33,02)	(36,43)	(40,18)	(44,32)	(48,88)
Selling, gen. & admin.	(3,96)	(4,99)	(5,50)	(6,07)	(6,70)	(7,39)	(8,15)
EBIT	3,19	3,45	3,81	4,20	4,64	5,11	5,64
Interst (on notes and old loans)	(1,10)	(0,73)	(0,70)	(0,65)	(0,59)	(0,51)	(0,41)
Interest (new loan @ 13%)		(0,98)	(0,98)	(0,98)	(0,98)	(0,98)	(0,98)
EBT	2,09	1,75	2,13	2,57	3,07	3,63	4,26
Taxes	0,00	(0,59)	(0,72)	(0,88)	(1,04)	(1,23)	(1,45)
EAT	2,09	1,15	1,41	1,70	2,03	2,40	2,81
EAT with extraord. Item	1,76						
EPS (in dollars)	7,55	4,96	6,04	7,29	8,70	10,28	12,06

Note. All the figures are in millions of dollars, except EPS, which is nominated in dollars

#### FCFF

	Actual			Projected				
	1996	1997	1998	1999	2000	2001	2002	2003
<b>FCFF</b>		1,58	1,28	1,42	1,55	1,72	1,89	3,72
EBIT(1-T)		2,28	2,51	2,77	3,06	3,37	3,72	3,72
CapEx		(1,72)	(1,90)	(2,09)	(2,31)	(2,55)	(2,81)	(1,68)
Amortization		1,03	1,14	1,26	1,38	1,53	1,68	1,68
Changes in NWC		(0,01)	(0,47)	(0,52)	(0,58)	(0,64)	(0,70)	0,00
		1,41	1,01	1,00	0,97	0,96	0,94	
WACC	12,33%							
growth rate	3,00%							
Terminal Value (2003)	39,88							
Discounted TV	19,84							
% of TV in overall value	75,9%							
<b>Firm Value</b>	<b>26,15</b>							
<b>Equity Value</b>	<b>11,99</b>							
Price of Equity	51,46							

FCFE

	Actual			Projected				
	1996	1997	1998	1999	2000	2001	2002	2003
<b>FCFE</b>		0,07	(0,40)	(0,19)	0,06	0,33	0,65	2,81
EAT		1,15	1,41	1,70	2,03	2,40	2,81	2,81
CapEx		(1,72)	(1,83)	(1,95)	(2,07)	(2,22)	(2,37)	(1,68)
Amortization		1,03	1,14	1,26	1,38	1,53	1,68	1,68
Changes in NWC		(0,01)	(0,47)	(0,52)	(0,58)	(0,64)	(0,70)	0,00
Changes in Loans and Principals		(0,39)	(0,65)	(0,67)	(0,70)	(0,74)	(0,77)	0,00
		0,06	(0,30)	(0,12)	0,03	0,15	0,26	
Θ (Debt to Capital)	55,45%							
Ke	16,66%							
growth rate	3,00%							
Terminal Value (2002)	20,56							
Discounted TV	8,16							
% of TV in overall value	98,92%							
<b>Equity Value</b>	<b>8,25</b>							
Price of Equity	38,7							

### Appendix 3

## WACC

<i>WORKSHEET FOR ESTIMATING RATINGS/INTEREST RATES</i>										
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%
D/(D+E)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%
D/E	0%	11%	25%	43%	67%	100%	150%	233%	400%	900%
\$ Debt	\$0,00	\$2,73	\$5,47	\$8,20	\$10,93	\$13,67	\$16,40	\$19,13	\$21,87	\$24,60
Beta	0,93	1,00	1,09	1,20	1,34	1,55	1,86	2,37	3,40	6,51
Cost of Equity	12,83%	13,17%	13,60%	14,15%	14,88%	15,91%	17,45%	20,02%	25,15%	40,70%
EBITDA	\$4,48	\$4,48	\$4,48	\$4,48	\$4,48	\$4,48	\$4,48	\$4,48	\$4,48	\$4,48
Depreciation	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03
EBIT	\$3,45	\$3,45	\$3,45	\$3,45	\$3,45	\$3,45	\$3,45	\$3,45	\$3,45	\$3,45
Interest	\$0,00	\$0,23	\$0,48	\$0,79	\$1,11	\$1,46	\$1,99	\$2,52	\$3,10	\$3,48
EBT	\$3,45	\$3,22	\$2,97	\$2,66	\$2,34	\$1,99	\$1,46	\$0,93	\$0,35	(\$0,03)
Tax	\$1,17	\$1,09	\$1,01	\$0,90	\$0,80	\$0,68	\$0,50	\$0,32	\$0,12	(\$0,01)
Net Income	\$2,28	\$2,12	\$1,96	\$1,75	\$1,54	\$1,32	\$0,96	\$0,62	\$0,23	(\$0,02)
(+)Depreciation	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03	\$1,03
CFO	\$3,31	\$3,15	\$2,99	\$2,78	\$2,57	\$2,35	\$1,99	\$1,65	\$1,26	\$1,01
EBIT/Interest	∞	14,92	7,12	4,36	3,11	2,37	1,73	1,37	1,11	0,99
CFO Int. Cov	∞	13,64	6,17	3,52	2,32	1,61	1,00	0,65	0,41	0,29
CFO/Debt	∞	1,15	0,55	0,34	0,24	0,17	0,12	0,09	0,06	0,04
Likely Rating	AAA	AAA	AA	A-	BBB	BB	B	B-	CCC	CCC
Interest Rate	8,46%	8,46%	8,86%	9,66%	10,16%	10,66%	12,16%	13,16%	14,16%	14,16%
Eff. Tax Rate	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	33,68%

### *WORKSHEET FOR CALCULATING WEIGHTED AVERAGE COST OF CAPITAL*

D/(D+E)	0,00%	10,00%	20,00%	30,00%	40,00%	50,00%	60,00%	70,00%	80,00%	90,00%
D/E	0,00%	11,11%	25,00%	42,86%	66,67%	100,00%	150,00%	233,33%	400,00%	900,00%
\$ Debt	\$0	\$3	\$5	\$8	\$11	\$14	\$16	\$19	\$22	\$25
Cost of equity	12,83%	13,17%	13,60%	14,15%	14,88%	15,91%	17,45%	20,02%	25,15%	40,70%
Cost of debt	5,58%	5,58%	5,85%	6,37%	6,70%	7,03%	8,02%	8,68%	9,34%	9,39%
WACC	12,83%	12,41%	12,05%	11,82%	11,61%	11,47%	11,79%	12,08%	12,51%	12,52%
	0	0	0	0	0	1	0	0	0	0
Firm Value (C)	\$25	\$26	\$27	\$27	\$28	\$28	\$27	\$27	\$26	\$26
Firm Value (G)	\$23	\$25	\$26	\$27	\$28	\$29	\$27	\$26	\$24	\$24

\*Firm Value (C): No growth in savings.  $\text{New Firm Value} = \text{Current Firm value} + \{(\text{WACC}(\text{current}) - \text{New WACC}) * \text{Current firm value} / \text{New WACC}\}$

\*Firm Value (G): Savings grow.  $\text{New Firm Value} = (\text{EBIT} * (1 - t) + \text{Depreciation} - \text{Capital Spending}) / (\text{New WACC} - g)$

### Damodaran's Rating

<i>Rating</i>	<i>Coverage</i>		<i>Spread</i>
AAA	9,65	100000	0,30%
AA	6,85	9,35	0,70%
A+	5,65	6,849999	1,00%
A	4,49	5,649999	1,25%
A-	3,29	4,489999	1,50%
BBB	2,76	3,289999	2,00%
BB	2,17	2,759999	2,50%
B+	1,87	2,169999	3,00%
B	1,57	1,869999	4,00%
B-	1,27	1,569999	5,00%
CCC	0,87	1,269999	6,00%
CC	0,67	0,869999	7,50%
C	0,25	0,669999	9,00%
D	-100000	0,249999	12,00%

## Appendix 4

### APV

#### Valuing unleveraged company

	Actual			Projected			
	1996	1997	1998	1999	2000	2001	2002
<b>Income Statement</b>							
Revenues	34,80	38,38	42,34	46,70	51,51	56,81	62,67
COGS	(27,65)	(29,94)	(33,02)	(36,43)	(40,18)	(44,32)	(48,88)
Selling, gen. & admin.	(3,96)	(4,99)	(5,50)	(6,07)	(6,70)	(7,39)	(8,15)
EBIT	3,19	3,45	3,82	4,20	4,63	5,10	5,64

*Note.* All the figures are in millions of dollars, except EPS, which is nominated in dollars

	Projected						
	1997	1998	1999	2000	2001	2002	2003
<b>FCFE</b>	1,19	1,01	1,11	1,21	1,34	1,48	3,72
EBIT(1-T)	2,28	2,52	2,77	3,06	3,37	3,72	3,72
CapEx	(1,72)	(1,90)	(2,09)	(2,31)	(2,55)	(2,81)	(1,68)
Amortization	1,03	1,14	1,26	1,38	1,53	1,68	1,68
Changes in NWC	(0,39)	(0,75)	(0,83)	(0,91)	(1,01)	(1,11)	0,00

Re	12,83%
growth rate	3,00%
Terminal Value (2002)	37,88
Discounted TV	18,36
% of TV in overall value	79,19%
<b>Equity Value</b>	<b>23,18</b>
Price of Equity	22,46

Value of leveraged company calculated with the usage of APV

D/D+E	E/D+E	D/E	Debt	EBIT/Interest	Interest	Spread, b.p.	Rating	Probability of default	PV (BC)	PV (Tax shield)	Value of leveraged company
0%	100%	0%	-	∞	-	4,61	AAA	0,00%	0,00	0,00	23,18
5%	95%	5%	1	20,47	0,16	4,61	AAA	0,00%	0,00	0,41	23,60
10%	90%	11%	3	9,70	0,33	4,61	AAA	0,00%	0,00	0,88	24,06
15%	85%	18%	4	6,11	0,52	4,61	AAA	0,00%	0,00	1,39	24,58
20%	80%	25%	6	4,31	0,74	4,61	AAA	0,00%	0,00	1,97	25,16
25%	75%	33%	8	2,20	1,45	10,61	AA	0,30%	0,02	2,63	25,79
30%	70%	43%	10	1,71	1,86	10,61	AA	0,30%	0,02	3,38	26,55
35%	65%	54%	12	1,36	2,34	10,61	AA	0,30%	0,02	4,24	27,41
40%	60%	67%	15	1,10	2,90	10,61	A	0,50%	0,03	5,26	28,41
45%	55%	82%	19	0,90	3,56	10,61	A	0,50%	5,80	5,26	22,64
50%	50%	100%	23	0,10	30,87	125	BBB	2,30%	5,80	5,26	22,64
55%	45%	122%	28	0,08	37,73	125	BBB	2,30%	5,80	5,26	22,64
60%	40%	150%	35	0,07	46,31	125	BB	12,20%	5,80	5,26	22,64
65%	35%	186%	43	0,06	57,33	125	BB	12,20%	5,80	5,26	22,64
70%	30%	233%	54	0,01	274,36	499	B	26,40%	5,80	5,26	22,64
75%	25%	300%	70	0,01	352,75	499	B	26,40%	5,80	5,26	22,64
80%	20%	400%	93	0,01	470,33	499	B	26,40%	5,80	5,26	22,64
85%	15%	567%	131	0,00	1 053,87	794	CCC	46,60%	5,80	5,26	22,64
90%	10%	900%	209	0,00	1 673,79	794	CCC	46,60%	5,80	5,26	22,64
95%	5%	1900%	441	0,00	3 533,55	794	CCC	46,60%	5,80	5,26	22,64
100%	0%	∞	-	-	∞	794	CCC	46,60%	-	-	-

## Appendix 5

### Operational Income Approach

Propability of default of leveraged company, t-student distribution

D/D+E	E/D+E	D/E	Debt	EBIT/Interest	Interest	Spread, b.p.	Rating	Propability of default
0%	100%	0%	-	$\infty$	-	4,61	AAA	0,00%
5%	95%	5%	1	21,16	0	4,61	AAA	0,51%
10%	90%	11%	3	10,02	0	4,61	AAA	0,65%
15%	85%	18%	4	6,31	1	4,61	AAA	0,85%
20%	80%	25%	6	4,46	1	4,61	AAA	1,18%
25%	75%	33%	8	2,27	2	10,61	AA	3,63%
30%	70%	43%	10	1,77	2	10,61	AA	7,14%
35%	65%	54%	13	1,41	2	10,61	AA	15,21%
<b>40%</b>	<b>60%</b>	<b>67%</b>	<b>16</b>	<b>1,14</b>	<b>3</b>	<b>10,61</b>	<b>A</b>	<b>32,87%</b>
45%	55%	82%	20	0,93	4	10,61	A	100,00%
50%	50%	100%	24	0,13	32	125	BBB	100,00%
55%	45%	122%	30	0,11	39	125	BBB	100,00%
60%	40%	150%	36	0,09	48	125	BB	100,00%
65%	35%	186%	45	0,07	60	125	BB	100,00%
70%	30%	233%	57	0,01	287	499	B	100,00%
75%	25%	300%	73	0,01	369	499	B	100,00%
80%	20%	400%	97	0,01	492	499	B	100,00%
85%	15%	567%	137	0,00	1 103	794	CCC	100,00%
90%	10%	900%	218	0,00	1 751	794	CCC	100,00%
95%	5%	1900%	461	0,00	3 698	794	CCC	100,00%
100%	0%	$\infty$	-	-	$\infty$	794	CCC	100,00%

Propability of default of leveraged company, t-student distribution, 1/3 deviation

D/D+E	E/D+E	D/E	Debt	EBIT/Interest	Interest	Spread, b.p.	Rating	Propability of default
0%	100%	0%	-	∞	-	4,61	AAA	0,00%
5%	95%	5%	1	21,16	0	4,61	AAA	1,44%
10%	90%	11%	3	10,02	0	4,61	AAA	1,78%
15%	85%	18%	4	6,31	1	4,61	AAA	2,25%
20%	80%	25%	6	4,46	1	4,61	AAA	2,95%
25%	75%	33%	8	2,27	2	10,61	AA	7,20%
30%	70%	43%	10	1,77	2	10,61	AA	12,01%
35%	65%	54%	13	1,41	2	10,61	AA	20,94%
40%	60%	67%	16	1,14	3	10,61	A	36,54%
45%	55%	82%	20	0,93	4	10,61	A	100,00%
50%	50%	100%	24	0,13	32	125	BBB	100,00%
55%	45%	122%	30	0,11	39	125	BBB	100,00%
60%	40%	150%	36	0,09	48	125	BB	100,00%
65%	35%	186%	45	0,07	60	125	BB	100,00%
70%	30%	233%	57	0,01	287	499	B	100,00%
75%	25%	300%	73	0,01	369	499	B	100,00%
80%	20%	400%	97	0,01	492	499	B	100,00%
85%	15%	567%	137	0,00	1 103	794	CCC	100,00%
90%	10%	900%	218	0,00	1 751	794	CCC	100,00%
95%	5%	1900%	461	0,00	3 698	794	CCC	100,00%
100%	0%	∞	-	-	∞	794	CCC	100,00%