Congoleum Corporation

Case #3

Jed Danziger
Masashi Kawabata
Zachary Mustin
Kathan Thakkar

Executive Summary:

Our objective for this case is to identify the value created from a potential LBO with Congoleum and to evaluate the gains and losses of various financing parties. Congoleum is a great candidate for an LBO due to its high earnings and low debt level. We valued the company post-LBO using the APV method, and used the Miles Ezzell approach to calculate $WACC_{ME}$ assuming that D/V was rebalancing after each period following the LBO exit. We valued the post-LBO firm at $1,401.65m. We then computed the value of the firm pre-LBO-announcement ($535m) to find the value created by the LBO, which was $866.65m.

We then analyzed the distribution of this value created and determined where it came from. However, we still found $743.42m additional value unaccounted for; therefore, we believe there exist other hidden factors or miscalculations in our analysis. We also determined the gains made by each of the involved parties. We found that existing shareholders, First Boston & Century Capital, Congoleum Management, and Prudential Insurance would gain significantly from the LBO deal. We also believed that $38 was a fair share price, since it benefited everyone.

Throughout our analysis, we made a few important assumptions for our calculations. First, we assumed the base case to have a debt beta of 0. Second, we assumed that past asset beta will stay constant throughout the non-constant growth period. Third, we assumed that net income is an appropriate metric to approximate the growth rate.

Our sensitivity analysis showed an interesting range of results. We tested a debt beta of 0.5, but our results stayed the same as the base case in monetary values. We also tried calculating growth rate based on net income, which increased the growth rate by an additional 1%. We then saw that the growth rate significantly contributed to strong gains and value, as this small change led to an additional $200m in gains.

Case Analysis:

Our ultimate goal is to evaluate Congoleum Corporation's finances and determine the value added by an LBO with First Boston and Prudential Insurance. Congoleum is a very strong candidate for an LBO. Congoleum has low debt compared to comparable companies in the same industry, and it has a very low D/E ratio (8%, Figure 3), which gives lots of potential to leverage up and amplify returns. For a company generating a staggering ROE of 23% yearly (Exhibit 9), Congoleum's debt level is ideal for strong returns on an LBO. Congoleum also has very good cash reserves and a high asset base, and Congoleum also reported promising and well growing numbers in their revenues and earnings (Exhibit 2). If Boston Capital were to finalize this LBO and take Congoleum private, great value can be added to the firm in cost savings, depreciation savings, tax shields, and improved efficiency.

Valuing Congoleum with an LBO

We used the APV method to value Congoleum: $V_L = V_U + PV(financial\ side\ effects)$. Our first step was to calculate the unlevered cash flows. We did this by taking the pre-tax operating profit (EBIT, Exhibit 13) and adjusting for taxes, depreciation, capital expenditures, and changes in net working capital (Figure 1). Next, we calculated the cost of equity (20.3%) based on the risk-free rate, market risk premium, and equity beta provided in Exhibit 9 (Figure 2). We also used the LT Debt % Cap (Exhibit 9) to represent the D/V ratio, which was used to calculate the E/V and D/E ratios for before the LBO announcement (Figure 3).

Next, we estimated the firm's growth rate (11.85%) by averaging the growth rate of income per share from previous years (Exhibit 8, Figure 9). We then used this *g* to predict the firm's future stock price, based on the initial price of $38, to calculate the firm's equity value

(Figure 4). We also summed the old and new debts to find the debt value (Figure 4). These values were then used to compute the D/V and E/V ratios for years 1980-1984 (Figure 4).

Our next step was to calculate $WACC_{ME} = r_A - T_C * r_D * (\frac{D}{V}) * (\frac{1+r_A}{1+r_D})$. To determine the cost of debt (r_D), we assumed that β_D is equal to zero. While this is not a perfect assumption, it is somewhat reasonable since debt is low-risk compared to equity. When calculating the cost of equity (r_E), we used the Miles Ezzell approach to rebalance the D/E ratio after each period to calculate $\beta_E = \beta_A + (\beta_A - \beta_D)(\frac{D}{E})(1 - T_C)$. The past asset beta was then calculated by unlevering: $\beta_A^{PAST} = (\frac{D}{V}) * \beta_D^{PAST} + (\frac{E}{V}) * \beta_E^{PAST}$, and the return on assets (r_A) was computed (Figure 5). With all our variables calculated, we were able to calculate the $WACC_{ME}$ for each year (Figure 5). It is worth noting that for each year, $WACC_{ME} < r_A$, which is a good sign.

At this point, we were ready to calculate $V_U = Cash_0 + \sum_{t=0}^{N} \frac{CF_t}{(1+r_A)^t}$. We split this calculation into non-constant and constant growth. Exhibit 7 reports $95.1m excess cash at the end of 1979. For the "non-constant growth" cash flows, we used the unlevered FCFs (Figure 1) and discounted using the asset beta (Figure 5), and summed to find our net present value (208.14, Figure 6). For the "constant growth" cash flows, we used the $WACC_{ME}$ for our exit valuation by assuming that D/V will stay constant. The growth rate was previously calculated (Figure 9), and our cash flow un-discounted by one year using the growth rate (Figure 7). We then summed the cash flows with both non-constant and constant growth rates to yield V_U = 1311.12 (Figure 8).

To calculate *PV(financial side effects)*, we used the "Total Interest Payments" listed in Exhibit 16 for years 1980-1984. Then, we calculated the present value of the interest tax shield for each year, and summed together to calculate the PVTS for years 1980-1984 (Figure 10). For future years, we generated a terminal value $TV_{TS} = TV_L - TV_U$ (Figure 11). TV_L was discounted

using $WACC_{ME}$. TV_U was discounted using r_A, because debt and interest inherit the value of the firm's assets, so we assume that $r_{TS} = r_A$. We then summed $PVTS^{1980\text{-}1984}$ with TV_{TS} to calculate Total *PV(financial side effects)* (Figure 11).

Finally, we valued the firm by summing $Cash_0$, V_U and *PV(financial side effects)* (Figure 12). We valued the firm at $1,401.65 million.

Value Created

To determine how much value was created by the LBO, we calculated the firm value before the LBO announcement. To calculate $V_L^{no\ LBO}$, we summed the old debt and the old equity (Exhibit 16, Figure 13). We then calculated the difference between $V_L^{with\ LBO}$ and $V_L^{no\ LBO}$ to find that the LBO created $866.65m worth of value. According to our analysis, the LBO is definitely worth pursuing, as it will generate large profits for all involved parties.

Incremental Effects of the LBO

Cost savings in corporate expenses were provided in Exhibit 13, and were then discounted using r_A. These present values were summed to show that $20.41m were saved in corporate expenses (Figure 14).

Money was also saved by the step-up of assets. We assumed straight-line depreciation, and found data about depreciation of fixed assets in Exhibit 14. We therefore calculated the present value of the depreciation for plant and equipment and found that $21.81m were saved by the asset step-up (Figure 15).

The savings from the interest tax shields were already calculated to be $81.01m (Figure 10). We then found the "additional value added" that was not accounted for by these three factors, and found that there was an additional $743.42m of added value. It is worth noting that $5m annually was saved as a result of Congoleum being a private company (Exhibit 14).

Another source of value created arises from manager's increased incentives to manage the firm well caused by their increased stake in the firm's success. However, it is unlikely that this motivation could generate more than $700m of value. Therefore, we conclude that there are either other hidden factors creating value, or that our estimate of value added is somewhat inaccurate.

Parties' Gains/Losses from the LBO

Existing shareholders' gains were fairly straightforward to calculate. Prior to the LBO announcement, Congoleum's stock price was $25.375 (page 1), and there were 12.2m shares outstanding. Given that $38 per share was being offered, shareholders made total gains of $154.03m (Figure 17).

In calculating the gains for the debt holders, we amortized $7.666m each year. We also assumed that for the senior notes, the debt was completely paid off at maturity in 1995. In addition, we wanted to discount using market Yield to Maturity (YTM), but we did not have this. Instead, we estimated YTM using the average yield of the CCC debts (Figure 2). We found that senior notes holders realized gains of $53.62m (Figure 18), and that subordinate notes holders realized gains of $24.76m (Figure 19).

We also calculated the post-LBO equity value in order to find the gains/losses on equity for each of the investors: $V_E = V_L - V_D$ = $1,184.47m (Figure 20). We then measured how much each company had invested in equity (page 5), and used that to calculate the relative equity investments (Figure 21). We then used that to calculate each parties' gain:

$$Gain = -Investment + \%\ Equity\ Owned\ (Equity\ post\ LBO).$$

We found that First Boston & Century Capital gained $99.60m, Congoleum Management gained $88.54m, and Prudential Insurance gained a staggering $945.13m (Figure 21). These values also account for the strip financing and equity kicker included as part of the deal.

Sensitivity Analysis

For sensitivity analysis, we tested basing our growth rate on net income (instead of income per share). Our new growth rate was 12.93%; we found that this led to about $200m increased terminal value, post-LBO equity, total gain, and most importantly value created when compared to our original analysis. We also challenged our initial assumption that $\beta_D = 0$ and tried using $\beta_D = 0.5$. While this did slightly increase the value of the LBO, we found the results to be quite insignificant, which supported our initial assumption that β_D was relatively unimportant compared to β_E.

Appendix:

William E. Fruhan, "Congoleum Corporation." Harvard Business School, Rev. February 19, 2008

Figure 1. Unlevered FCF: LBO Happening Scenario

FCF = OCF - NCS - CNWC		Tax	48%				
OCF = EBIT * (1-T) + Depreciation							
						NOTE: UFCFs for if the LBO happens	
Year	Pre-tax Operating Profit (EBIT)	Depreciation	OCF	Capital Expenditures	Net Working Capial	Δ in Non-Cash Working Capital	Unlevered Free Cash Flow
1980	71.69	35.51	72.8	15	122	2	55.79
1981	90.84	36.26	83.5	16.2	136	14	53.30
1982	115.73	37.07	97.2	17.5	159.3	23.3	56.45
1983	113.15	37.95	96.8	18.9	170.5	11.2	66.69
1984	137.27	21.23	92.6	20.4	183.3	12.8	59.41

Figure 2. Cost of Equity

R(f)	9.5%
Mkt Risk Prem	8.6%
Equity Beta	1.25
Cost of Equity	20.3%
Average Yield for CCC	15.19%
Yield Spread	5.69%
Annual default %	2%
Bond return	-55%
Yield Spread	5.7%

Figure 3. Debt to Equity Ratio

D/V ratio	7%
E/V	93%
D/E	8%

Figure 4: Exhibit 14 forecasted Debt-Equity Ratio

				$38 share price * (1+g)					
Exhibit 16	Old Debt	New Debt	Debt	Stock Price Assumption	Firm Equity Value	E in $Million	V	D/V	E/V
1980	15.97	337.93	353.9	42.5	518554316.2	519	872	40.56%	59.44%
1981	15.52	313.67	329.19	47.5	580022819	580.022819	909.212819	36.21%	63.79%
1982	15.31	289.3	304.61	53.2	648777688.3	648.78	953.39	31.95%	68.05%
1983	2.86	265.04	267.9	59.5	725682637.1	725.68	993.58	26.96%	73.04%
1984	2.61	214.57	217.18	66.5	811703761.1	811.70	1028.88	21.11%	78.89%
					^^ 12.2 million (introduction)			^use these for D/V ratio	

Figure 5: Identifying Current Cost of Equity + WACC(me)

	1980	1981	1982	1983	1984
Debt Beta	0	0	0	0	0
Past Asset Beta	1.1625	1.1625	1.1625	1.1625	1.1625
Cost of Debt	9.5%	9.5%	9.5%	9.5%	9.5%
Debt	353.9	329.19	304.61	267.9	217.18
Equity	519	580.022819	648.78	725.68	811.70
V	$872.45	$909.21	$953.39	$993.58	$1,028.88
D/E Ratio	68.25%	56.75%	46.95%	36.92%	26.76%
Tax	48%	48%	48%	48%	48%
Current equity beta	1.92	1.79	1.69	1.57	1.46
Current cost of equity	26.0%	24.9%	24.0%	23.0%	22.1%
D/E * (1 - ((r(d) * Tax) / (1+ r(d)))	65%	54%	45%	35%	26%
Return on asset	19.5%	19.5%	19.5%	19.5%	19.5%
WACC(me)	17.5%	17.7%	17.9%	18.2%	18.4%

Figure 6: Non-Constant Growth Period

Non-Constant Growth Period			
Year	FCF	r[A]	CF[t]/(1+r[a])^t
0	55.79	0.19	55.79
1	53.30	0.19	44.60
2	56.45	0.19	39.53
3	66.69	0.19	39.08
4	59.41	0.19	29.14
		Sum	208.14

Figure 7: Constant Growth Period

Constant Growth Period				
*We can use WACCme in exit valuation by assuming D/V will stay constant				
Year	growth rate	CF[t+1]	WACCme	Terminal Value
t + 1	11.85%	66.45280274	18.4%	1,007.89

Figure 8: V[u] Calculation

V[u] = cash + non-constant + constant			
Excess Cash	Non-Constant Growth Period	Constant Growth Period	V[u]
95.1	208.14	1,007.89	1311.128544
^^ based on exh 7			

Figure 9: Estimating Growth Rate

Growth Rate				
We take the expected net income growth and see the average % growth in the upcoming years (Exhibit 8)				
Year	Net Income per share	Growth		
1978	3.58			
1979	3.8	6.15%		
1980	4.35	14.47%		
1981	5	14.94%		
Total Average Growth		11.85%		

Figure 10: PV of Tax Shields

Calculating PV(financial side effects)					
Year	**1**	**2**	**3**	**4**	**5**
Total interest payment	42.92	40.56	37.33	34.12	29.87
Tax Shield	20.60	19.47	17.92	16.38	14.34
PV of Tax Shield	18.81	17.78	16.36	14.96	13.09
				SUM	**81.01**

Figure 11: Total PV of Financial Side Effects

PVTS from 1985 onwards								
TV(Tax shields) = TV[l] - TV[u]								
TV[l]	**TV[u]**	**TV[TS]**						
360.23	340.83	19.41						
Total PV(financial side effects)								
PVTS[1980-1985]	TV[TS]	Discounted TV[TS]	Total PVTS					
81.01	19.41	9.51775514	**90.53**					
		discount by 1+rA b/c assume firm is rebalanced, therefore debt & interest inherits value of assets, therefore r[TS] = r[A]						
		discount by 4 b/c bring it back 4 periods from 1985						

Figure 12: V[I] with LBO

V[l] with LBO		
V[u]	**PVTS**	**V[l]**
1311.128544	90.53	**1,401.65**

Figure 13: Total Value Created

Old Debt	Old Equity	V[l] w/out LBO	V[l] w/ LBO	Value created
16.45	519	535	1,401.65	866.65

Figure 14: Cost Savings in Corporate Expenses

Cost Savings in Corporate Expenses		Data from exhibit 13			
Assume year 0 is 1980					
Year	**0**	**1**	**2**	**3**	**4**
Cost Savings	4.3	5.1	5.9	6.8	7.6
PV	4.3	4.27	4.13	3.99	3.73
				SUM	**20.41**

Figure 15: Cost Savings in Asset Depreciation

Asset Depreciation Savings		Data from Exh 14		
Assume straight line method				
Fixed asset base:	200.2			
Type	**Value**	**Life**	**Depreciation (annual)**	**PV(Depreciation)**
Plant	100.1	20	5.005	0.73
Equipment	100.1	7	14.3	21.08
			SUM	**21.81**

Figure 16: Total Value Created

Total Value Created	Savings in Corporate Expenses	Depreciation Savings	Interest Tax Shields	Additional Value Added
866.65	20.41	21.81	81.01	743.42

Figure 17: Gains for Existing Shareholders

For existing shareholders:			
Share price prior to announcement	**Price offered per share**	**# shares (millions)**	**Gains existing shareholders**
25.375	38	12.2	**$154.03**
data taken from intro on page 1			

Figure 18: Gains from Senior Notes

1. Scheduled Payments - senior notes (Millions	Year 1 = 1980 & amortization begins 1/31/81															
Principal	115Million	Amortized	7.666	million every year from 1981												Matures at 19
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Initial Inflow	115															
Promised Payment (11.25%)		-12.94	-12.94	-12.08	-11.21	-10.35	-9.49	-8.63	-7.76	-6.90	-6.04	-5.18	-4.31	-3.45	-2.59	-1.73
Principal	115	115	107.334	99.668	92.002	84.336	76.67	69.004	61.338	53.672	46.006	38.34	30.674	23.008	15.342	7.676
Cash Flow	115	-12.94	-12.94	-12.08	-11.21	-10.35	-9.49	-8.63	-7.76	-6.90	-6.04	-5.18	-4.31	-3.45	-2.59	-9.39
Assumption: ytm is determined by taking avg of CCC debt yields																
CCC debt ytm	15.19%															
NPV(ytm)	$49.96															

Figure 19: Gains from Subordinate Notes

2. Scheduled Payments - subordinate notes (Millions)		Year 1 = 1980 & amortization begins 1/20/89																		
Principal	92Million	Amortized	7.666	million every year																
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Initial Inflow	92																				
Promised Payment (12.25%)		-11.27	-11.27	-11.27	-11.27	-11.27	-11.27	-11.27	-11.27	-11.27	-10.33	-9.39	-8.45	-7.51	-6.57	-5.64	-4.70	-3.76	-2.82	-1.88	-0.94
Principal	92	92	92	92	92	92	92	92	92	84.334	76.668	69.002	61.336	53.67	46.004	38.338	30.672	23.006	15.34	7.674	0.008
Cash Flow	92	-11.27	-11.27	-11.27	-11.27	-11.27	-11.27	-11.27	-11.27	-11.27	-10.33	-9.39	-8.45	-7.51	-6.57	-5.64	-4.70	-3.76	-2.82	-1.88	-0.95
Assumption: ytm is determined by taking avg of CCC debt yields																					
CCC debt ytm	15.19%																				
NPV(YTM)	$24.76																				

Figure 20: Equity post LBO

Equity Value post LBO (1984)		
V[l] post LBO	Debt post LBO	Equity post LBO
1,401.65	217.18	1,184.47

Figure 21: Parties Gains/Losses

Parties Gains/Losses			
Party	Investment	% Equity Owned	Gain
First Boston & Century Capital	4.5	8.79%	99.60
Congoleum Management	4	7.81%	88.54
Prudential Insurance	42.7	83.40%	945.13
Total	51.2	1	1133.27

Figure 22: Sensitivity Analysis

Sensitivity Analysis	Base Case	Growth rate of 12.93%	Debt beta of 0.5
Current Equity Beta (1984)	1.46	1.45	1.37
Current Cost of Equity (1984)	22.06%	21.94%	21.31%
Return on Assets (1984)	19.50%	19.50%	19.80%
WACC(me) (1984)	18.45%	18.49%	18.33%
Terminal Value	$1,007.89	$1,206.43	$1,026.65
V[U]	$1,311.13	$1,509.67	$1,329.00
V[L]	$1,401.65	$1,599.91	$1,420.03
Equity Post LBO	$1,184.47	$1,382.73	$1,202.85
Total Gain	$1,133.27	$1,331.53	$1,151.65
Additional Value Added	$743.42	$936.71	$765.69