CHAPTER 17
THE LEVERAGED BUYOUT OF CHEEK PRODUCTS, INC.

In this leveraged buyout, the debt level of the company changes through time. Since the debt level changes through time, the APV method is appropriate for evaluating the LBO. The steps we must undertake are:

Step 1: Calculating the present value of unlevered cash flows for the first five years.
Step 2: Calculating the present value of the unlevered cash flows beyond the first five years.
Step 3: Calculating the present value of interest tax shields for the first five years.
Step 4: Calculating the present value of interest tax shields beyond the first five years.

Step 1: Calculating the present value of unlevered cash flows for the first five years.

The income statement presented does not include interest, so it is the projected unlevered cash flows of the company. To find the cash flows each year, we find the operating cash flow by adding depreciation back to net income. Next, we subtract any capital expenditures, changes in net working capital, and add the asset sales. So, the unlevered cash flows each year will be:

	2007	2008	2009	2010	2011
Sales	$1,627.00	$1,824.00	$1,965.00	$2,012.00	$2,106.00
Costs	432.00	568.00	597.00	645.00	680.00
Dep	287.00	305.00	318.00	334.00	340.00
EBT	$908.00	$951.00	$1,050.00	$1,033.00	$1,086.00
Tax	363.20	380.40	420.00	413.20	434.40
Net income	$544.80	$570.60	$630.00	$619.80	$651.60
Capital expenditures	$165.00	$143.00	$180.00	$182.00	$195.00
Change in NWC	$(72.00)	$(110.00)	$60.00	$56.00	$64.00
Asset sales	$840.00	$610.00			
Unlevered cash flows	$1,578.80	$1,452.60	$708.00	$715.80	$732.60

Since these are unlevered cash flows, we need to discount at the unlevered cost of equity. Because the company currently has no debt, the required return on assets is equal to the cost of equity. So, using this discount rate, we find the present value of the unlevered cash flows for the next five years will be:

$$PV = \$1,578.80 / 1.14 + \$1,452.60 / 1.14^2 + \$708.00 / 1.14^3 + \$715.80 / 1.14^4 + \$732.60 / 1.14^5$$
$$PV = \$3,784.82$$

Step 2: Calculating the present value of the unlevered cash flows beyond the first five years.

The assumption given is that the cash flows will grow at 3.5 percent into perpetuity. Again, we discount these cash flows at the unlevered return on equity. So, the value of these cash flows in Year 5 will be:

Unlevered CF value in Year 5 = [$732.60(1 + .035)] / (.14 − .035)
Unlevered CF value in Year 5 = $7,221.34

The value today of this terminal value is:

$PV = \$7,221.34 / 1.14^5$
PV = $3,750.54

Step 3: Calculating the present value of interest tax shields for the first five years.

The interest tax shield each year is the interest paid times the tax rate. To find the present value of the interest tax shield, we need to discount these at the pretax cost of debt, so the present value of the interest tax shield for the first five years is:

$PV = (\$1,140)(.40) / 1.125 + (\$1,100)(.40) / 1.125^2 + (\$1,180)(.40) / 1.125^3 + (\$1,150)(.40) / 1.125^4$
$\qquad + (\$1,190)(.40) / 1.125^5$
PV = $1,635.81

Step 4: Calculating the present value of interest tax shields beyond the first five years.

Finally, we must calculate the value of tax shields associated with debt used to finance the operations of the company after the first five years. The assumption given in the case is that debt will be reduced and maintained at 25 percent of the value of the firm from that date forward. Under this assumption it is appropriate to use the WACC method to calculate a terminal value for the firm at the target capital structure. This in turn can be decomposed into an all-equity value and a value from tax shields. Note that we need to use the interest rate on the debt beyond Year 5 in these calculations. If the capital structure changes after the first five years, the levered cost of equity can be found with to Modigliani-Miller Proposition II with corporate taxes:

$R_S = R_0 + (B/S)(R_0 − R_B)(1 − t_C)$
$R_S = .14 + (.33)(.14 − .08)(1 − .40)$
$R_S = .1520$ or 15.20%

Now, we can calculate the WACC for the company beyond Year 5. The WACC at this point will be:

$R_{WACC} = [B / (B + S)](1 − t_C)R_B + [S / (B + S)]R_S$
$R_{WACC} = [.33](1 − .40)(.08) + [1 / (.33)](.1520)$
$R_{WACC} = .1260$ or 12.60%

We can use the WACC to calculate the terminal value of the levered company, which will be:

$V_L = [\$732.60(1 + .035)] / (.1260 − .035)$
$V_L = \$8,332.32$

Using Modigliani-Miller's valuation of a levered firm:

$$V_L = V_U + t_C B$$

we can value the interest tax shield as:

$8,332.32 = $7,221.34 + Interest tax shield
Interest tax shield = $1,110.98

This is the value of the interest tax shield beyond Year 5. Discounting this at the cost of debt over the first five years, we find the value today is:[1]

$PV = $1,110.98 / 1.125^5$
PV = $616.51

We have valued all future cash flows of the company. The value of the unlevered cash flows today is:

Value of unlevered CF = $3,784.82 + 3,750.54
Value of unlevered CF = $7,535.36

And the value of the interest tax shield today is:

Value of interest tax shield = $1,635.81 + 616.51
Value of interest tax shield = $2,252.32

So, the total value of the company today is:

Value of company today = $7,535.36 + 2,252.32
Value of company today = $9,787.68

So, the most the group should offer per share is:

Price = $9,787.68 / 104
Price = $94.11

---

[1] A good argument can be made that since post-1993 debt levels are proportional to firm value, the tax shields are as risky as the firm and should be discounted at the rate R_0.