

# **FIN 521: Case 5: Dupont Corporation**

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## Question 1

From Kullman's view, the company needs transition of their business from a commodity chemical business to a specialty chemical and science-driven business, and DPC is no longer fit the strategic vision. Furthermore, expected growth rate of the division does not meet firm's target. It is the main reason why DuPont is considering a sale of the performance coating division. From the analysis by DuPont itself, it expects that annual growth of sales will be 3% to 5%, and growth of operating margin will be 10% to 12%.

## Question 2

PE funds are more likely to buy DPC rather than strategic buyer. From the case, PE funds look for mature firms which do not require large capital expenditures or R&D. Strategic firms want to acquire firm which can make synergy with their original business. Considering industrial background and current status of DPC, PE funds are more likely to buy DPC because the industry is in steady state, therefore DPC does not need substantial capital or R&D to expand their business.

## Question 3

According to the case, the return drivers for a private equity are the use of leverage, growth in EBITDA, and multiple arbitrage. Leverage can reduce tax, and also help augment a sponsor's return. PE firms can get benefits from growth in EBITDA, they can raise EBITDA to the level of comparable companies by improving the target's operation. They also can get benefits from multiples by selling firms at higher multiple than which when buying it.

## Question 4

- a) If revenue growth is 5% per year, and others are not changed, enterprise value will be increased to 4,116 because of increase in revenue.
- b) In this case, because EBIT increases, enterprise value will also be increased to 4,859.
- c) If terminal multiple increases to 8.0x rather than 7.0x, terminal value increases from 6,207 to 7,032, therefore enterprise value increases to 5,345.
- d) At first, the firm raises debt at  $7.0 \times 372 = 2,604$  amount. Since the firm uses all available cash to pay down debt, the amount of free cash flow to equity will be zero because cash will be paid down debt, and therefore amount of debt and interest expense will decrease. If the firm raises debt, there will be interest tax shield, therefore enterprise value will be increased by the amount of tax shield. The amount of interest tax shield is 147(discounted at cost of debt), therefore enterprise value will be increased to

5,491. Table 1 and table 2 shows the result of valuation after change variables. The underlined value is changed value.

Metric	Closing	Projected				
	2011A	2012E	2013E	2014E	2015E	2016E
Sales Growth (%)	12.5%	<u>5.0%</u>	<u>5.0%</u>	<u>5.0%</u>	<u>5.0%</u>	<u>5.0%</u>
Depreciation and Amortization	\$104	\$115	\$118	\$122	\$125	\$130
EBIT Margin (Pretax)	6.3%	<u>12.0%</u>	<u>12.0%</u>	<u>12.0%</u>	<u>12.0%</u>	<u>12.0%</u>
Tax Rate	25%	25%	25%	25%	25%	25%
Capital Expenditures	\$80	\$115	\$122	\$132	\$144	\$150
Net Working Capital (%)		15%	15%	15%	15%	15%
Terminal EBITDA Multiple (x)						<u>8.0</u>
Cost of debt	6.75%					
Unlevered Cost of Equity	11.2%					

Table 1: Stand-Alone Valuation of DPC

- e) Table 3 shows changes in enterprise value by changing metrics. It shows that enterprise value increases most after changing EBIT margin: 744, and the second largest driver was EBITDA multiple, which increases enterprise value by 485. Therefore, we can conclude that the key driver for increasing enterprise value is growth in EBITDA.

## Question 5

If the buyers do not change anything, they will get zero return because enterprise value of the firm will never change, therefore they cannot get any positive return from the firm value. Furthermore since buyers do not use leverage, they don't have to pay any interest, therefore their return will be zero.

## Question 6

- a) From question 5-d, the PE fund raises debt by 2,604 million dollars. Therefore, if it buys DPC of 4.5 billion dollars, the amount of equity required is  $4,500 - 2,604 = 1,896$  million dollars.
- b) Since the firm uses all available cash to pay down debt, we assumed that there is no dividend paid out from 2012 to 2016. Assuming this, enterprise value at 2016 is calculated as 7,032, which includes terminal value of free cash flows, and there is 1,481 amount of remaining debt, and 75 amount of after tax expense. Therefore, cash flow for calculating IRR is  $7,032 - 1,481 - 75 = 5,476$ . Since there is 1,896

amount of equity investment at initial period and no intermediate cash flows, IRR is calculated as about 24%.

- c) Assuming the amount of debt is same as 2,604 million dollars, and set IRR at fixed amount of 20%, we calculated maximum enterprise value by using Excel Goal Seek function. From the result, the maximum amount of available payment is about 2,200.23 million dollars, therefore adding up with the amount of debt, maximum enterprise value of the firm is calculated as  $2,604 + 2,200.23 = 4,804.22$ .
- d) By changing the amount of debt from  $EBITDA \times i$ , where  $i = 1, 2, 3 \dots 10$ , we calculated IRR, and Figure 1 shows the relationship between IRR and the amount of equity invested. From the plot, we can

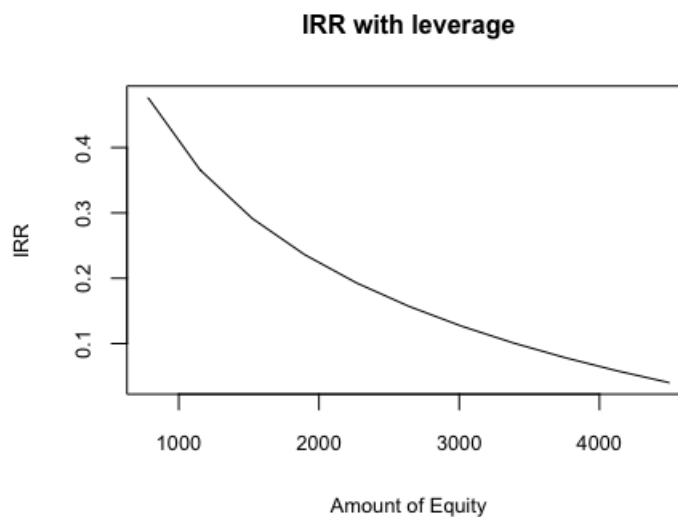


Figure 1: IRR against the amount of equity invested

discover that IRR decreases as the amount of equity invested increases. It justifies the needs of debt financing when acquiring a firm. Furthermore, assuming PE firm cannot use leverage, we calculated maximum enterprise value a fund can pay for remaining IRR as 20% using the same method in c). It was calculated as 3,831.675, which is lower than result from c). It also justifies needs for debt financing.

- e) There is some advantages using debt for buying firms. First, it can reduce costs of capital benefiting from interest tax shield. Second, it can raise opportunities of acquiring large firm with fixed IRR. From c), and d), we discovered that the maximum enterprise value the firm can pay for increases when using debt. However, there is also some disadvantages for using debt. The major disadvantage is increase in cost of equity, which increases risk of the investment including failure to paying out debt. Another disadvantage is proportion of ownership. If the firm uses debt their proportion of ownership will decrease.

## Question 7

DuPont sold DPC to Carlyle, which is one of the private equity's top investors. The selling price was \$4.9 billion, and after purchase, EBITDA increased by about 20%. Consequently net income increased about 3.2%. From the newspaper article at 2016, its enterprise value increased to 9.6 billion dollars. Carlyle finally shed its stake at 2016, and its annualized total return from its investor is 80%. It cleared its position by 6 ways, including IPO and Berkshire Hathaway deal.

	2011A	Closing	2012E	2013E	2014E	2015E	2016E
Net Sales	4,281		<u>4,495</u>	<u>4,720</u>	<u>4,956</u>	<u>5,204</u>	<u>5,464</u>
Pretax Operating Income (EBIT)	268		<u>539</u>	<u>566</u>	<u>595</u>	<u>624</u>	<u>656</u>
Interest Expense			(176)	(160)	(141)	(122)	(100)
Earnings before Taxes			364	407	453	503	556
Taxes			(91)	(102)	(113)	(126)	(139)
Net Income			273	305	340	377	417
Depreciation and Amortization	104		115	118	122	125	130
Increase in Net Working Capital			(32)	(34)	(35)	(37)	(39)
Capital Expenditures			(115)	(122)	(132)	(144)	(150)
Free Cash Flow (FCF)			372	387	401	412	433
EBITDA	372		654	684	717	749	786
Terminal Value							<u>6,599</u>
FCF, including TV			372	387	401	412	7,032
After tax interest expense			132	120	106	91	75
Change in Debt			(241)	(267)	(295)	(321)	(1,481)
Debt		<u>2,604</u>	<u>2,363</u>	<u>2,096</u>	<u>1,801</u>	<u>1,481</u>	<u>0</u>
Cash		<u>2,604</u>	<u>2,604</u>	<u>2,604</u>	<u>2,604</u>	<u>2,604</u>	
Enterprise Value (EV)		<b>5,345</b>					
Interest Tax Shield			44	40	35	30	25
PV Tax Shield		<b>147</b>					
EV with Tax Shield		<b>5,491</b>					

Table 2: APV analysis

Metrics	Change in enterprise value
Sales growth	146
EBIT margin	744
Terminal EBITDA multiple	485
Debt	147

Table 3: Changes of enterprise value by changing metrics