

Chapter 11: A Framework for Analyzing Dividend Policy

Problem 1.

	Current	Projected
EBITDA	1200	1350
Less Depreciation	200	250
EBIT	1000	1100
Less Interest Expenses	200	200
EBT	800	900
Less Taxes	320	360
Net Income	480	540
Free Cash Flow Computation		
EBIT	1000	1100
Less Interest	200	200
Less Taxes	320	360
Less (Cap. Exp.- Depr.) x (1- proportion financed by debt)	210	168
Less (Change in Working Cap.) x(1- prop. financed by debt)	35	35
Free Cash Flow to equity	235	337

- a. The current payout ratio = $(2 \times 50m.) / 480 = 0.208333$
- b. It's currently paying out $100/95 = 42.55\%$ of free cash flow to equity

Project	Investment	Beta	IRR (Using Cash flows to equity)	Reqd. return to equity	
A	\$190m.	0.6	12.00%	11.80%	accept
B	\$200m.	0.8	12.00%	12.90%	reject
C	\$200m.	1	14.50%	14.00%	accept
D	\$200m.	1.2	15.00%	15.10%	reject
E	\$100m.	1.5	20.00%	16.75%	accept

- c. The required rate of return on equity = $.085 + 1(.055) = .14$ or 14%.
Projects C, D and E are NPV>0 projects according to this yardstick

The total capital expenditure needs for next year are: $200 + 100 + 190 = 490$ m.

d. The maximum amount available is 337m.

e. We are told that the investment opportunities for the firm are changing. It is unclear exactly what this means. However, if this implies uncertainty, the firm might not want to pay out 100% of its free cash flow to equity.

f. Cash balance next year =	Cash balance this year	100
	Plus Free Cash flow to equity	337
	Less Dividends next year	125
		= 312

Problem 2.

a.

Change in FCFE =	
Reduction in prod. Costs	20000
plus reduction in inventory	15000
Plus addnl depreciation	2400
less capital expenditures	12000
less addnl taxes	13040 (tax rate)x(cost reductions-depreciation)
=	12360

b. The amount of depreciation will decrease over time because we are using (accelerated) MACRS depreciation. The inventory reduction will contribute to cash flow only in the first year since there will not be any incremental reductions in inventory after this year.

Problem 3.

a. No, because there would be double taxation, i.e. both at the corporate level and at the personal level.

b. In that case, it might be preferable to increase dividends now. The alternative would be to either take a large capital gain when the business would be sold, or a large dividend just before the business is sold. Hence, unless there are other capital losses that can be offset only by capital gains, it would be preferable to take larger dividends now.

Problem 4.

Project	Investment Requirement	After-tax return on capital
A	15	27%
B	10	20%
C	25	16%
D	20	14%
E	30	12%

The after-tax cost of debt = $12\%(1-0.5) = 6\%$

The cost of equity = $.08 + 1.25(0.055) = 14.875\%$

The market value of debt = \$500m.

The market value of equity = $15(100) = \$1500$ m.

Hence, the WACC = $(500/2000)(6\%) + (1500/2000)(14.875\%) = 12.656\%$

Assuming that the projects are as risky as the firm, all of them except E have NPV > 0. Hence, capital needed for investment = \$70m. However, 25% of this will come from debt issues. Hence free cash flow to equity = $100 - (0.75)(70) = \$47.5$ m.

a., b. Since the company has an extra \$47.5m., it should return that amount to shareholders. However, the firm should also look at estimates of future investment needs and future cash flows.

Problem 5.

Project	Initial Investment	Beta	IRR (to equity investors)	Reqd. rate of return	
A	\$500	2	21%	20%	accept
B	\$600	1.5	20%	17%	accept
C	\$500	1	12%	15%	reject

Free Cash flow to equity =	Net Income	1000
	Less (1-0.2)(Cap. Exp. - Depreciation)	480
	Less (1-0.2)(Change in WC)	80
		= 440

Note: Change in Working capital is computed as $5000(0.08)$.

Hence it can return a maximum of \$440 to shareholders

Problem 6.

The weighted average cost of capital =

$$\frac{100}{100 + (50)(10)}(1 - 0.4)10\% + \frac{(50)(10)}{100 + (50)(10)}16\% = 14.33\%$$

Initial Investment	EBIT	Annual Depr.	Lifetime	Salvage	Cash flow per yr.	NPV
10	1	0.5	5	2.5	1.1	-4.97358
40	5	1	10	10	4	-16.7809
50	5	1	10	10	4	-26.7809

- a. Since all projects have NPV < 0, none of them should be accepted.
- b. The firm has free cash flow to equity equal to Net Income + (1 -) (Capital expenditures - Depreciation) = 90 + 8 = \$98m. This is the maximum that it can pay out in dividends. This assumes that some of the depreciation is used to pay back debt. Alternatively, I would add back the entire depreciation to the net income to get \$ 100 million as FCFE.

Problem 7.

	Current	Next year	in 2 yrs	in 3 yrs
EBIT	80	72	64.8	58.32
Depreciation	70	63	56.7	51.03
Working Capital	70	63	56.7	51.03
Change in WC		-7	-6.3	-5.67
Net Income	48	43.2	38.88	34.992
Dividends	24	21.6	19.44	17.496
Increase in Cash		91.6	82.44	74.196

If these funds are invested at 10%, the size of the war chest will be $91.6(1.1)^2 + 82.44(1.1) + 74.20 = \$275.72m$.

Problem 8. The strategy described may or may not be optimal. A disadvantage is that a large amount of cash is being accumulated. If there are no desirable projects in the telecommunications industry, these resources may be misused by management. On the other hand, there may be strategic advantages in acquiring a large target in three years. For that purpose, it may be necessary to have high flexibility in the form of cash.

Problem 9.

	Current	1	2	3
Net Income	\$ 100.00	\$ 110.00	\$ 121.00	\$ 133.10

+ Deprec'n	\$ 50.00	\$ 54.00	\$ 58.32	\$ 62.99
- Cap Ex	\$ 60.00	\$ 60.00	\$ 60.00	\$ 60.00
- Chg in WC	\$ 10.00	\$ 10.00	\$ 10.00	\$ 10.00
= FCFE	\$ 80.00	\$ 94.00	\$ 109.32	\$ 126.09
Dividends Paid		\$ 66.00	\$ 72.60	\$ 79.86
Cash Balance	\$ 50.00	\$ 78.00	\$ 114.72	\$ 160.95

Total cash at the end of three years = \$ 160.95 million

Problem 10.

Project	Equity Investment	CF to Equity	Return to Equity	Beta	Cost of Equity
A	100000	12500	12.50%	1	11.75%
B	100000	14000	14.00%	1.5	14.50%
C	50000	8000	16.00%	1.8	16.15%
D	50000	12000	24.00%	2	17.25%

I am assuming that the cash flow to equity divided by the equity investment to get the return on equity. Take projects A and D. The capital expenditures will be \$ 150,000.

Net Income next year = (Gross Profit - Interest - Depreciation) (1-tax rate) =
 $(\$1,000,000(1.1)(1-0.4)-100,000-100,000)(1-0.4) = \$276,000$.

a. FCFE = Net Income - (Net Cap. Expenditures)(1-) - WC(1-) = $\$276,000 - (150,000-100,000)(1-0.4) - (1,000,000-500,000)(0.10)(1-0.4) = \$216,000$. This is the amount that the company can afford to pay out in dividends.

b. If the company actually pays out \$1 per share, or \$100,000 next year, it will have $\$150,000 + 216,000 - 100,000 = \$266,000$ at the end of next year.

Problem 11.

a. The firm has net positive financing needs, since its net income is less than projected net capital expenditures. Hence it cannot afford to pay any dividends; as it is, it must raise additional equity capital.

b.

	<i>Current</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Net Income	\$ 10.00	\$ 14.00	\$ 19.60	\$ 27.44	\$ 38.42
- (Cap Ex-Depr)	\$ 20.00	\$ 22.00	\$ 24.20	\$ 26.62	\$ 29.28

It will be 4 years before dividends can be paid.

Problem 12.

Year	Net Income	Cap. Exp.	Depr.	Noncash Working Capital	Change in Noncash WC	Dividends	FCFE
1991	240	314	307	35	25	70	220.8
1992	282	466	295	-110	-145	80	266.4
1993	320	566	284	215	325	95	-44.2
1994	375	490	278	175	-40	110	271.8
1995	441	494	293	250	75	124	275.4

- a. Conrail could have paid dividends each year equal to its FCFE.
- b. The average accounting return on equity that Conrail is earning = 13.5%, compared to a required rate of return = $0.07 + 1.25(0.125 - 0.07) = 13.875$. Hence Conrail's projects have done badly on average. It's average dividends have been much lower than the average FCFE. Hence, it would seem that Conrail has been paying too low dividends.

Problem 13.

Year	Net Income	(Cap Ex - Depr)	Ch WC (1-DR)	FCFE
	(1-DR)			
1996	\$485.10	\$151.96	\$8.75	\$324.39
1997	\$533.61	\$164.11	\$9.19	\$360.31
1998	\$586.97	\$177.24	\$9.65	\$400.08
1999	\$645.67	\$191.42	\$10.13	\$444.12
2000	\$710.23	\$206.73	\$10.64	\$492.86

This is the amount that the company can afford to pay in dividends.

- b. The perceived uncertainty in these cash flows will make me more conservative in paying out the entire amount in FCFE in the year in which I make it.

Problem 14.

	1995	1996	1997	1998	1999	2000
Net Income	66.00	77.22	90.35	105.71	123.68	144.70
Cap. Exp.	150.00	165.00	181.50	199.65	219.62	241.58
Depreciation	50.00	57.50	66.13	76.04	87.45	100.57
Noncash Working Capital	43.00	47.30	52.03	57.23	62.96	69.25
Change in Noncash WC		4.30	4.73	5.20	5.72	6.30
Proportion of Net Cap. Exp. Financed by debt	0.00	0.00	0.00	0.00	0.00	0.00
FCFE (without any debt)		-34.58	-29.76	-23.10	-14.21	-2.60
FCFE (with 25% borrowing)		-6.63	0.27	9.10	20.26	34.22

a., b. The payout will be constrained by the FCFE, which is given in the last two rows.

Problem 15. The required rate of return on equity was $.07 + 1.2(.055) = 13.6\%$, while Cracker Barrel earned 25% on equity. Hence management is using its resources well, and the money is better retained and invested in the business than returned to investors.

Problem 16.

	1995	1996
Net Income	128	140.8
Cap. Exp.	50	55
Depr.	24	26.4
WC	500	550
Change in WC		50
FCFE		70.06

a. Manpower will have \$160.06m. next year to pay out as dividends

b. At the end of next year, Manpower should have $143 + 70.06 - 12 = \$201.06$.

Problem 17.

If Manpower does not plan to use debt, but instead plans to payoff its debt, its FCFE would be $62.2 - 100 = -37.8$, as shown below. In this case, its cash balance would drop by $37.8 + 12 = \$49.8$ m. from this year to the next.

	1995	1996
Net Income	128	140.8
Cap. Exp.	50	55
Depr.	24	26.4
WC	500	550
Change in WC		50
FCFE		62.2

Problem 18.

Company	FCFE	Dividends Paid	ROE	Beta	Reqd. ROR	Is ROE > Cost of Equity?	Dividends/FCFE
Alexander & Brown	55	35	8%	0.8	11.40%	no	63.64%
American President	60	12	14.50%	1.3	14.15%	yes	20.00%
OMI Corporation	-15	5	4.00%	1.25	13.88%	no	-33.33%
Overseas Shipholding	20	12	1.50%	0.9	11.95%	no	60.00%
Sea Containers	-5	8	14%	1.05	12.78%	yes	-160.00%

- Alexander and Brown and Overseas Shipholding both have a bad record on returns on equity, while paying low dividends relative to FCFE. They should increase dividends.
- Sea Containers should pay less in dividends, since it already has negative FCFE, while earning a high rate of return relative to its cost of equity.
- If returns in this industry were expected to be higher in the future, I would moderate my recommendations for higher dividends.

Problem 19.

Company	Payout ratio	Div. Yld	Exp. Growth
Black and Decker	24	1.3	23
Average for competitors	32	2.58	19.1

a., b., Black and Decker has a low payout ratio and low dividend yield, relative to competitors. However, this is consistent with the higher growth rate that Black and Decker has. Ceteris paribus, higher growth rates go hand in hand with lower payout

ratios. By using the relationship $\text{Growth rate} = \text{ROE} * (\text{Retention ratio})$, we see that Black and Decker's ROE is 30.26%, while that for its competitors is 30.16. This means that there is no significant difference in Black and Decker's performance. Consequently, it would seem that Black and Decker should increase its payout ratio.

Problem 20.

- a. Based on the regression, the predicted dividend yield for Black and Decker is $0.0478 - 0.0157(1.3) - 0.0000008(5,500) + 0.006797(0.35) + 0.0002(0.145) - 0.09(0.04) = 2.21\%$
- b. In this case, we are using a larger set of firms for comparison. Furthermore, we are using other bases for comparing Black and Decker with other firms. Even though we don't need as many independent variables in the first part of the problem because we are making intra-industry comparisons, nevertheless, the adjustment is not exactly the same in both cases. Note that the qualitative answer is the same in both cases.

Problem 21. Using the relationship $\text{Growth rate} = \text{ROE} * (\text{Retention ratio})$, we can estimate Handy and Harman's ROE to be $.23 / (1 - 0.23) = 29.87\%$. The comparable number for the industry is 18.18%. If Handy and Harman's cost of equity is similar to that of other firms in the industry, its lower payout ratio is justified.

Problem 22. The high payout policy could end up draining the firm of its assets, thus reducing the value of existing bonds. This could increase equity values even though the value of the firm as a whole might drop due to the poor projects.