CHAPTER 21
FREE CASH FLOW VALUATION

1. (C) 1.09.

Explanation

The risk free rate is (8% – 2%) = 6%. We are told that the market risk premium is 11%, and we calculated the cost of equity (required return) to be (10 million / 55.6 million =) 18%. Since we know the risk-free rate, the market risk premium, and the discount rate, we can use the capital asset pricing model to solve for beta:

Required rate of return = 0.18 = 0.06 + (b x 0.11)

0.18 – 0.06 = b x 0.11

0.12 = b x 0.11

b = 1.09

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

2. (A) Dividends are often viewed as "sticky." Managers are reluctant to radically change the dividend payout policy while FCFE often has immense variability.

Explanation

Dividends and the FCFE are often different and dividends are used as a signal to the market not FCFE. Dividends viewed as sticky is the true statement.

(Module 21.5, LOS 21.f)

Related Material

SchweserNotes - Book 3

3. (A) increase in the year the borrowing occurred.

Explanation

An increase in financial leverage will increase net borrowing and, hence, increase FCFE in the year the borrowing occurred because: FCFE = FCFF – [interest expense] (1 – tax rate) + net borrowing.

(Module 21.5, LOS 21.f)

Related Material

SchweserNotes - Book 3

4. (C) after-tax interest and net borrowing.

Explanation

FCFE = FCFF – [interest expense] (1 – tax rate) + net borrowing.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

5. (B) dividend payments.

Explanation

A firm's FCFE is the cash available to stockholders after funding capital expenditures and debt principal repayments.

(Module 21.5, LOS 21.f)

Related Material

SchweserNotes - Book 3

6. (C) consistent with assumptions of other variables.

Explanation

The assumption of growth should be consistent with assumptions about other variables, Net capital expenditures (capital expenditures minus depreciation) and beta (risk) used to calculate required rate of return should be consistent with assumed growth rate.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

7. (B) may be higher than free cash flow to equity FCFE.

Explanation

Dividends represent the cash that the firm chooses to pay to the shareholders and the amount of the dividend is subject to the discretion of the firm. Dividends can be equal to, lower or higher than FCFE. For example, sometimes firms may pay dividends in years when there is a net loss.

(Module 21.5, LOS 21.f)

Related Material

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8. (C) after-tax weighted average cost of capital.

Explanation

Since the FCFF is the cash available to all the investors, the after-tax weighted average cost of capital should be used as the discount rate in FCFF models.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

9. (C) non-cash charges and interest charges are zero.

Explanation

The answer is shown by the relationship between FCFF and net income: FCFF = NI + NCC + Int (1 – tax rate) – FCInv – WCInv. Further: FCFF = EBIT (1 – tax rate) + Dep – FCInv – WCInv, which assumes that depreciation is the only non-cash charge.

(Module 21.5, LOS 21.h)

Related Material

SchweserNotes - Book 3

10. (B) Interest payments to bondholders.

Explanation

Interest payments to bondholders are included in the income statement and are already subtracted to calculate net income.

(Module 21.1, LOS 21.c)

Related Material

SchweserNotes - Book 3

11. (B) plus after-tax interest expense.

Explanation

Free cash flow to the firm is equal to cash flow from operations minus fixed capital investment plus after-tax interest expense.

(Module 21.2, LOS 21.c)

Related Material

SchweserNotes - Book 3

12. (A) –89.5.

Explanation

FCFF = EBIT x (1 – tax rate) + dep – FC_{INV} – WC_{INv}

FCFF = 415 x (1 – 0.30) + 60 – 400 – 40 = –89.5

Alternatively:

FCFF = [EBITDA x (1 – tax rate)] + (dep x tax rate) – FC_{INV} – WC_{INv}

FCFF = [475 x (1 – 0.30)] + (60 x 0.30) – 400 – 40 = –89.5

Depreciation:

Accumulated depreciation 31 December 2011 = $890

Accumulated depreciation 31 December 2012 = $950

With no asset sales during the period the depreciation charge for 2012 = $60

Fixed capital investment:

This is equal to capital expenditures (because there are no asset sales), which is equal to the change in gross PP&E:

FC_{INV} = 2000 – 1600 = 400

Working capital investment:

This is the change in the working capital accounts, excluding cash and short-term borrowings.

Working capital = receivables + inventory – payables

WC_{INv} = (220 + 265 – 50) – (200 + 245 – 50) = 40

(Module 21.4, LOS 21.d)

Related Material

SchweserNotes - Book 3

13. (A) 10.5.

Explanation

FCFE = FCFF – Int (1 – tax rate) + net borrowing

FCFE = –89.5 – 200(1 – 0.3) + 240 = 10.5

Net borrowing is the difference between the long-term and short-term debt accounts (the impact caused by amortization of premiums and discounts should be removed if debt is not issued at par):

= (620 + 70) – (400 + 50) = 240

Alternatively:

FCFE = NI + dep –FC_{INV} – WC_{INV} + net borrowing

= [(415 – 200) x 0.7] + 60 – 400 – 40 + 240 = 10.5

(Module 21.4, LOS 21.d)

Related Material

SchweserNotes - Book 3

14. (B) Incorrect Correct

Explanation

Dividends, share repurchases, and share issues have no effect on either FCFF or FCFE. FCFF and FCFE represent the total cash flow available before financing decisions. Share repurchases represent uses of those cash flows.

If debt is repaid FCFE, will decrease in the current year because of reduced (negative) net borrowings and will increase in future years as interest expense is reduced.

(Module 21.1, LOS 21.b)

Related Material

SchweserNotes - Book 3

15. (C) Correct Incorrect

Explanation

FCFF = [EBIT x (1 – tax rate)] + dep – FC_{INV} – WC_{INv}

We assume that the only non-cash charge that appears above EBIT is depreciation. In general however the rule is to adjust for any non-cash charges that appear above EBIT.

FCFF = [EBITDA × (1 – tax rate)] + (dep × tax rate) – FC_{INV} – WC_{INV}

(Module 21.4, LOS 21.d)

Related Material

SchweserNotes - Book 3

16. (C) a common stockholder.

Explanation

Dividends are most relevant to the stockholders who receive them and who have little control over their amount.

(Module 21.1, LOS 21.b)

Related Material

SchweserNotes - Book 3

17. (A) Two-stage free cash flow to the firm (FCFF) model.

Explanation

Of the cash flow valuation models mentioned above, the two-stage FCFF model is most useful in analyzing the firms that have high leverage and high growth. The high growth will make the stable growth models inapplicable, while the high leverage makes the FCFF model more attractive.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

18. (C) both are incorrect.

Explanation

To estimate FCF, we can construct the following table using the table given and the information about growth in net income:

$(in millions)	2004	2005	2006	2007	2008
Net Income	10	15	20	25	30
Plus: Depreciation	5	6	5	6	5
Less: Capital Expenditures	7	8	9	10	12
Free Cash Flow	8	13	16	21	23

The estimated free cash flow for 2006 is $16 million. Johnson's statement is incorrect. Since none of Beachwood's debt is allocated to Country Point, all the financing is in the form of equity, so FCFF and FCFE are equal. Nguyen's statement is also incorrect.

(Module 21.5, LOS 21.k)

Related Material

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19. (A) FCFE = (EBIT x (1 – tax rate)) + Depreciation – FCInv – WCInv.

Explanation

The correct version of this equation is:

FCFF = (EBIT x (1 – tax rate)) + Depreciation – FCInv – WCInv

(Module 21.5, LOS 21.k)

Related Material

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20. (B) 7%.

Explanation

We know the terminal value in 2008 is $223.7 million. We can calculate the free cash flow in 2008 to be $23 million (= $30 million net income + $5 million depreciation – $12 million capital expenditures). (See the table in question 1). Thus, we can solve for the estimated growth rate:

Terminal value = [CF@2008 x (growth rate + 1)] / (discount rate – growth rate) 223.7 million = ($23 million x (growth rate + 1)) / (0.18 – growth rate)

223.7 million x (0.18 – growth rate) = 23 million x (growth rate + 1)

40.266 – (223.7 x growth rate) = 23 million + (23 x growth rate)

17.266 = 246.7 x (growth rate)

growth rate = 0.07

Nguyen's growth rate assumption is 7% per year

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

21. (B) free cash flow to the firm model.

Explanation

A dividend discount model is inappropriate, as dividends are not related to the earnings stream. In addition, as this is a takeover situation a free cash flow approach is more suitable as the acquirer has control and discretion over the distribution of the total free cash flow. With dividend discount models a minority, interest is assumed (i.e., no control over dividend policy).

FCFF model is preferred to FCFE as FCFE is negative and volatile and leverage is high.

(Module 21.1, LOS 21.d)

Related Material

SchweserNotes - Book 3

22. (A) 379.

Explanation

High Growth Period	Year 1	Year 2	Year 3
Growth rate	30%	30%	30%
FCFF	11.7	15.21	19.773
PV(@18%)	9.915	10.924	12.034

Transitional Period	Year 4	Year 5	Year 6
Growth rate	22%	14%	6%
FCFF	24.123	27.500	29.150
PV(@18%/15%)	$*\frac{1}{1.15*1.18^3}$	$*\frac{1}{1.15^2*1.18^3}$	$*\frac{1}{1.15^3*1.18^3}$

	= 12.767	= 12.656	= 11.666

Terminal value as of Year 6 using the FCFF projected for Year 7.

Terminal value = 29.150 (1.06) / (0.10 – 0.06) = 772.48

PV of terminal value = 772.48 / (1.15^3 x 1.18^3) = 309.135

Value of the firm = 9.915 + 10.924 + 12.034 + 12.767 + 12.656 + 11.666 + 309.135 = 379

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

23. (A) with patents or firms in an industry with significant barriers to entry.

Explanation

The two-stage model is best suited to analyzing firms in a high growth phase that will maintain that growth for a specific period, such as firms with patents or firms in an industry with significant barriers to entry. Companies growing at a rate similar to or less than the nominal growth rate of the economy are best suited for the single-stage FCFE Model. Companies in high growth industries correspond to the three-Stage FCFE Model.

(Module 21.5, LOS 21.j)

Related Material

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24. (A) $16.86.

Explanation

Estimates for the future FCFE based on supplied growth rates are:

Year	1	2	3	4	5	6	7
Growth rate	10.5%	10.5%	10.5%	8.5%	6.5%	5.0%	3.0%
FCFE/share	$0.995	$1.099	$1.214	$1.318	$1.403	$1.473	$1.518

$R_{\$}$ = 1.518/(12.0% – 3.0%) = 16.861

(Module 21.5, LOS 21.k)

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25. (B) $13.55.

Explanation

We find the value of the equity/share by discounting all future FCFE/share by the required rate of return on equity.

Value of equity /share =

$$\frac{0.995}{(1.12)} + \frac{1.099}{(1.12)^2} + \frac{1.214}{(1.12)^3} + \frac{1.318}{(1.12)^4} + \frac{1.403}{(1.12)^5} + \frac{1.473 + 16.867}{(1.12)^6} = \$13.55 / \text{share}$$

Using our calculator, enter $CF_0 = 0$; CO1 = 0.995; CO2 = 1.099; CO3 = 1.214; C04 = 1.318; CO5 = 1.403; C06 = 1.473 + 16.867 = 18.34; I = 12; Compute → NPV = 13.55.

(Module 21.5, LOS 21.k)

Related Material

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26. (A) 10.5%.

Explanation

The debt-to-equity ratio of 25.0% means that the debt-to-total value is 25.0%/125.0% or 20.0%. The weight of debt is thus 20.0% and the weight of equity is 80.0%.

The WACC = [0.20 x (0.075) x (1 – 0.40)] + (0.80 x 0.12) = 10.5%

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

27. (A) $153 million.

Explanation

The estimated FCFF for year 0 is $9.55 million and the WACC is 10.5% as calculated. If the growth rate for the firm is estimated as 4.0%, the value of the firm is:

$9.55 million x (1.04)/(0.105 – 0.04) = $152,800,000.

(Module 21.5, LOS 21.k)

Related Material

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28. (B) higher than depreciation in the stable-growth phase.

Explanation

If capital expenditures estimates are significantly higher than depreciation for the stable growth period, then the three-stage FCFE model might result in an extremely low value. One possible solution for the problem is to grow the capital expenditures more slowly than deprecation in the transition period to narrow the difference. Another is to assume that capital expenditures and depreciation will offset when growth normalizes.

(Module 21.1, LOS 21.a)

Related Material

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29. (A) a required rate of return close to the market rate of return and capital expenditures that are not too large relative to depreciation expense.

Explanation

A firm that is in a stable growth phase should have growth rate close to that of the

economy, and the cost of equity should approximate the required rate of return on the market. In addition, expense. the capital expenditures should not be disproportionately large relative to the depreciation expenses.

(Module 21.5, LOS 21.j)

Related Material

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30. (B) lower than the required rate of return used for the high-growth phase.

Explanation

In most cases, the required rate of return used to calculate the terminal value should be lower than the required rate of return used for initial high-growth phase. During the stable period the firm is less risky and the required rate of return is therefore lower.

(Module 21.5, LOS 21.l)

Related Material

SchweserNotes - Book 3

31. (C) Required returns are higher in FCFE discount models than they are in dividend discount models, since FCFE is more difficult to estimate.

Explanation

Although FCFE may be more difficult to estimate than dividends, the required return is based on the risk faced by the shareholders, which would be the same under both models.

(Module 21.5, LOS 21.f)

Related Material

SchweserNotes - Book 3

32. (C) $77.15.

Explanation

The required rate of return in the high-growth period is (r) = 0.04 + 1.3(0.06) = 0.118.

The required rate of return in the stable-growth period is (r) = 0.04 + 1.0(0.06) = 0.10.

The Present Value (PV) of the FCFE in the high-growth period is (3.05 / 1.118) + (4.10 /1.118^2) + (5.24 / 1.118^3) + (6.71 / 1.118^4) = 14.06.

The Terminal Price = Expected $FCFE_{n+1}$ /(r – g_n) with $FCFE_{n+1}$ = FCFE in year 5 = $_{\text{Earnings per share}}$ – (Capital Expenditures – Depreciation)(1 – Debt Ratio) – (Change in working capital)(1 – Debt Ratio) = 8.10 – 0(1 – 0.4) – 2.00(1 – 0.4) = 6.90.

The Terminal Price = 6.90 / (0.10 – 0.03) = 98.57.

The PV of the Terminal Price = (98.57 / 1.118^4) = 63.09.

The value of a share today is the PV of the FCFE in the high-growth period plus the PV of the Terminal Price = 14.06 + 63.09 = 77.15.

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

33. (C) $195.71.

Explanation

Year 1 FCFE = Earnings per share – (Capital Expenditures – Depreciation)(1 – Debt Ratio) – (Change in working capital)(1 – Debt Ratio) = 6.60 – (2.28 – 1.37) (1 – 0.25) – (1.1)(1 – 0.25) = 5.09.

Year 8 FCFE = Earnings per share – (Capital Expenditures – Depreciation)(1 – Debt Ratio) – (Change in working capital)(1 – Debt Ratio) = 24.27 x 1.05 – 0 – (2.25)(1 – 0.25) = 23.79.

The Terminal Value (as of Year 7) = 23.79 / (0.10 – 0.05) = 475.80.

The value of BOX, Inc., stock would be equal to: $5.09 / 1.25 + 7.63 / 1.25^2 + 11.01 / [(1.25)^2(1.15)^1] + 14.67 / [(1.25)^2(1.15)^2] + 18.08 / [(1.25)^2(1.15)^3] + 20.62 / [1.25)^2(1.15)^4] + 21.89 / [(1.25)^2(1.15)^5] + 475.80 / [(1.25)^2(1.15)^5] =$

4.07 + 4.88 + 6.13 + 7.10 + 7.61 + 7.55 + 6.97 + 151.40 = 195.71

(Module 21.5, LOS 21.k)

Related Material

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34. (B) Free cash flow (FCF).

Explanation

Dividend policy can be changed by the buyer of a firm. Thus, the FCF perspective looks to the source of dividends in a position of control rather than directly at dividends. The price to enterprise value approach does not focus on cash flows.

(Module 21.1, LOS 21.b)

Related Material

SchweserNotes - Book 3

35. (C) $11.21.

Explanation

Step 1: Calculate each year's FCFE and discount at the required return.

- FCFE = net income + depreciation – capital expenditures – increase in working capital – principal repayments + new debt issues
- Year 1: 10.0 + 3.0 – 2.5 - 1.0 – 1.5 = 8.0,
- PV = 7.08 = 8.0 / $(1.13)^1$, or FV = –8.0, I = 13, PMT = 0, N = 1, Compute PV
- Year 2: 10.0 x 1.10 + 3.0 – 2.5 – 1.0 – 1.5 = 9.0,
- PV = 7.05 = 9.0 / $(1.13)^2$, or FV = –9.0, I = 13, PMT = 0, N = 2, Compute PV
- Year 3: 10.0 x $(1.10)^2$ + 3.0 – 2.5 – 1.0 – 1.5 = 10.10
- PV = 7.00 = 10.10 / $(1.13)^3$, or FV = –10.10, I = 13, PMT = 0, N = 3, Compute PV

Step 2: Calculate Present Value of final cash flow times FCFE multiple.

- Value at end of year 3 = FCFE3 x multiple = 10.10 x 13 = 131.30
- PV = 91.00 = 131.30 / $(1.13)^3$, or using calculator, N = 3, FV = –131.30, I = 13, PMT = 0, Compute PV

Step 3: Calculate per share value.

- Add up PV of FCFE and end value and divide by number of shares outstanding
- = (7.08 + 7.05 + 7.00 + 91.0) / 10.0 = 11.21

(Module 21.4, LOS 21.d)

Related Material

SchweserNotes - Book 3

36. (A) calculate historical free cash flow and apply an expected growth rate.

Explanation

Historical free cash flows are often used for forecasting.

(Module 21.5, LOS 21.e)

Related Material

SchweserNotes - Book 3

37. (A) The value will decrease.

Explanation

Everything else being constant, a decrease in free cash flow to equity should decrease the value of the firm.

(Module 21.5, LOS 21.i)

Related Material

SchweserNotes - Book 3

38. (B) Two-stage FCFE Model.

Explanation

The two-stage FCFE model is most suited for analyzing firms in high growth that will maintain that growth for a specific period, such as firms with patents or firms in an industry with significant barriers to entry.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

39. (B) There is a transition period where the growth rate declines.

Explanation

In the three-stage FCFE model, there is an initial phase of high growth, a transition period where the growth rate declines, and a steady-state period where growth is stable.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

40. (A) fairly valued.

Explanation

Based on a free cash flow valuation model, Sudbury Industries shares appear to be fairly valued.

Since Sudbury is an all-equity firm, WACC is the same as the required return on equity of 8%.

The firm value of Sudbury Industries is the present value of FCFF discounted by using WACC. Since FCFF should grow at a constant 3 percent rate, the result is:

Firm value = $FCFF_1$ / WACC-g = 400 million / 0.08–0.03 = 400 million / 0.05 = $8,000 million

Since the firm has no debt, equity value is equal to the value of the firm. Dividing the $8000 million equity value by the number of outstanding shares given the estimated value per share:

V_0 = $8,000 million/100 million shares = $80.00 per share

(Module 21.5, LOS 21.m)

Related Material

SchweserNotes - Book 3

41. (C) $2,975.00.

Explanation

The stable growth FCFF model assumes that FCFF grows at a constant rate forever. FCFF in Year 0 is equal to EBIT(1 – tax rate) + Depreciation – Capital Spending - Working Capital Additions = 500(1 – 0.4) + 200 – 300 – 30 = 170. The Firm Value = $FCFF_1$ / ($r – g_n$) = 170(1.05) / (0.11 – 0.05) = $2,975.

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

42. (C) decrease.

Explanation

Debt repayment will decrease net borrowing and, hence, decrease FCFE because: FCFE = FCFF – [interest expense] (1 – tax rate) + net borrowing.

(Module 21.5, LOS 21.f)

Related Material

SchweserNotes - Book 3

43. (A) $50,000,000.

Explanation

The overall value of the firm is $4,000,000 / (0.10 – 0.05) = $80,000,000. Thus, the value of equity is $80,000,000 – $30,000,000 = $50,000,000.

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

44. (A) Total asset turnover is 0.556, financial leverage is 2.07, and ROE is 11.5%.

Explanation

ROE using the DuPont three component approach:

ROE = profit margin x asset turnover x financial leverage

$$= \frac{\text{profit}}{\text{sales}} \times \frac{\text{sales}}{\text{assets}} \times \frac{\text{assets}}{\text{equity}}$$

$$= \frac{72.4}{721.9} \times \frac{721.9}{1299.2} \times \frac{1299.2}{628.7}$$

= 0.100 x 0.556 x 2.066 = 0.1149 = 11.5%

Note that it is typical to compute ROE based on opening equity for valuation contexts, whilst in FRA we typically use average values. The CFA Institute curriculum does note that some analyst compute ROE in a valuation context using average balance sheet values so care should be taken to follow the instructions in the question whether to use opening or average values.

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

45. (B) 8.7%.

Explanation

Sustainable growth rate:

g = ROE x earnings retention rate

g = 11.54% x (1 – (17.6 / 72.4)) = 11.54% x 0.757 = 8.736%

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

46. (A) $33 per share.

Explanation

Cost of equity = $R_f \beta(R_m — R_f)$

= 4.5% + 1.3(6%) = 12.3%

Using the H model:

Dividend = 17.6m / 12m = $1.47

$$MV_0 = \frac{D_0(1+g_1)}{k-g_1} \times \frac{D_0 \times H(g_h + g_1)}{k-g_1}$$

$$MV_0 = \frac{1.47(1+0.06)}{(0.123-0.06)} \times \frac{1.47 \times \frac{6}{2}(0.18-0.06)}{(0.123-0.06)}$$

MV = $24.73 + $8.40

MV = $33.13

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

47. (C) $1,968m.

Explanation

Using a two stage model:

$FCFF_1$ = $46m

WACC = (12.3% x 0.5) + (7 x (1 – 0.3) x 0.5) = 8.6%

$$MV_{firm} = \frac{46}{(1.086)^1} + \frac{46(1.12)}{(1.086)^2} + \frac{46(1.12)^2}{(1.086)^3} + \frac{46(1.12)^2(1.06)}{(0.086-0.06)(1.086)^3}$$

MV_{firm} = 42.36 + 43.68 + 45.05 + 1,836.69

MV_{firm} = 1967.78

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

48. (B) The Dividend Discount approach.

Explanation

The dividend discount model is most appropriate for valuing a minority equity position in a dividend-paying company. The free cash flow approach looks to the source of dividends from the perspective of an owner that has control rather than directly at dividends.

(Module 21.1, LOS 21.b)

Related Material

SchweserNotes - Book 3

49. (A) depreciation.

Explanation

Depreciation is usually the largest non-cash expense.

(Module 21.2, LOS 21.c)

Related Material

SchweserNotes - Book 3

50. (A) The value will increase.

Explanation

Everything else being constant, a decrease in the relevant required rate of return should increase the value of the equity per share.

(Module 21.5, LOS 21.i)

Related Material

SchweserNotes - Book 3

51. (C) dividends are not paid.

Explanation

Free cash flow approaches are best when dividends are not paid. Both remaining responses have nothing to do with the decision.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

52. (C) The value in controlling the firm's dividend policy.

Explanation

The difference between the value estimate produced by the DDM and the one produced by the FCFE model can be interpreted as the value of controlling the firm's dividend policy.

(Module 21.5, LOS 21.g)

Related Material

SchweserNotes - Book 3

53. (C) will be financed using the target debt ratio.

Explanation

It is usually assumed that the investment in working capital will be financed consistent with the target debt ratio.

(Module 21.5, LOS 21.e)

Related Material

SchweserNotes - Book 3

54. (C) dividends are paid but do not reflect the company's capacity to pay dividends.

Explanation

FCF approaches are best when dividends are paid but do not appear to be representative of the firm's capacity to pay them. Both remaining responses have nothing to do with the decision.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

55. (A) use different discount rates.

Explanation

Free cash flow to the firm uses the weighted average cost of capital and free cash flow to equity uses the cost of equity. The key is to use a discount rate that reflects the opportunity cost of the indicated investor group.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

56. (C) deducting taxes, adding back depreciation, and deducting the investments in fixed capital and working capital.

Explanation

As presented in the reading: FCFF = EBIT (1 – tax rate) + Dep – FC_{Inv} – WC_{Inv}.

(Module 21.2, LOS 21.c)

Related Material

SchweserNotes - Book 3

57. (C) $5.09.

Explanation

Year 1 FCFE = Earnings per share – (Capital Expenditures – Depreciation) (1 – Debt Ratio) – Change in working capital (1 – Debt Ratio)

Year 1 FCFE = 6.60 – (2.28 – 1.37)(1 – 0.25) – (1.1)(1 – 0.25) = 5.09

(Module 21.4, LOS 21.d)

Related Material

SchweserNotes - Book 3

58. (A) the required rate of return exceeds the growth rate.

Explanation

The one-stage model using either free cash flow to equity (FCFE) or free cash flow to the firm (FCFF) assumes that the required rate of return exceeds the growth rate. If this was not the case, the model would produce an unrealistic negative price.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

59. (C) interest payments to bondholders.

Explanation

FCFF includes the cash available to all of the firm's investors, including bondholders. Therefore, interest payments to bondholders are not removed from revenues to derive FCFF. FCFE is FCFF minus interest payments to bondholders plus net borrowings from bondholders.

(Module 21.5, LOS 21.i)

Related Material

SchweserNotes - Book 3

60. (C) Overhaul's debt ratio is significantly higher than the industry average.

Explanation

The difference between FCFF and FCFE is related to capital structure and resulting interest expense. When the company's capital structure is relatively stable, FCFE is easier and more straightforward to use. FCFF is generally the best choice when FCFE is negative or the firm is highly leveraged. The fact that Overhaul's debt ratio is significantly higher than the industry average would argue against the use of FCFE. Hence, this is the least likely reason to favor FCFE.

(Module 21.5, LOS 21.i)

Related Material

SchweserNotes - Book 3

61. (B) 7%.

Explanation

Since Firm Value = $FCFF_1$ / (WACC - g), we first need to determine $FCFF_1$, which is FCFF in 2006: FCFF = NI + NCC + [Int x (1 – tax rate)] – FCInv – WCInv

= 16.9 + 80 + [34 x (1 – 0.35)] – (480 – 400) – [(55 – 70) – (50 – 50)]

= 16.9 + 80 + 22.1 – 80 – (–15) = 54

Firm Value = $FCFF_1$ / (WACC - g)

1080 = 54 / (0.12 – x)

[(1080)(0.12)] – 1080x = 54

129.6 – 1080x = 54

75.6 = 1080x

0.07 = x

The expected growth rate in FCFF that Carson must have used is 7%.

(Module 21.5, LOS 21.i)

Related Material

SchweserNotes - Book 3

62. (A) $26.5 million.

Explanation

FCFE = NI – [(1 – DR) x (FCInv – Dep)] – [(1 – DR) x WCInv]

Where: DR = target debt to asset ratio

FCFE = 16.9 – [(1 – 0.36) x (480 – 400 – 80)] – [(1 – 0.36) x ((55 – 70) – (50 – 50))]

= 16.9 – (0.64 x 0) – (0.64 x (-15))

= 16.9 + 0 + 9.6 = 26.5

(Module 21.5, LOS 21.i)

Related Material

SchweserNotes - Book 3

63. (B) $0.77.

Explanation

FCFE = net profit - NetFCInv - WCInv + DebtFin = $1.88 - $1.63 - 0.38 + 0.90

= 0.77

(Module 21.4, LOS 21.d)

Related Material

SchweserNotes - Book 3

64. (A) the growth rate in the stable-period is too high.

Explanation

If the growth rate in the stable-period is too high or the high-growth and transition periods are too long, the three-stage FCFE model might result in an extremely high value.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

65. (C) Weighted average cost of capital.

Explanation

Free cash flow to the firm valuation uses the opportunity cost relevant to the overall firm, which is the weighted average cost of capital.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

66. (C) No, neither interpretation is correct.

Explanation

Free cash flow to the firm (FCFF) is the cash flows that are free to investors after cash operating expenses (including taxes but excluding interest expense), working capital investments, and fixed capital investments have been made. Free cash flow to equity

(FCFE) is FCFF less interest payments to bondholders and net borrowing from bondholders.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

67. (C) The target debt-to-asset ratio accounts for the financing of new investment in fixed capital and working capital.

Explanation

When forecasting FCFE, it is common to assume that a firm will maintain a target debt-to-asset ratio for new investments in fixed capital and working capital. Based on this assumption, the formula for forecasting FCFE is:

FCFE = NI – [(1 – DR) x (FCInv – Dep)] – [(1 – DR) x WCInv]

By multiplying the fixed capital and working capital investments by one minus the target debt-to-asset ratio, you are left with the investment amount less the amount financed by debt, which is the net borrowing amount. Therefore, this formula accounts for net borrowing through the target debt-to-asset ratio.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

68. (C) Yes, the free cash flow from equity valuation would be higher if there were a premium associated with control of firm.

Explanation

The ownership perspectives of dividend-based and FCFE based valuations are different. Dividend-based valuations take the perspective of minority shareholders, while FCFE based valuations take the perspective of an acquirer who will assume a controlling position in the firm. If investors were willing to pay a premium for a controlling position in the firm, then the equity value computed under the FCFE approach would be higher.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

69. (A) Current year FCFE decreases, but future FCFE will be increased.

Explanation

Changes in leverage do have a small effect on FCFE. A decrease in leverage will cause the current year FCFE to decrease through the repayment of debt. Future FCFE will be increased because interest expense will be lower.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

70. (A) $81.54.

Explanation

Use the two-stage FCFF model to value the firm. The Terminal Value of the firm as of Year 3 = 11.56 / (0.12 – 0.02) = 115.60. The value = 5.95 / (1.20) + 7.06 / $(1.20)^2$ + (8.25 + 115.62) / $(1.20)^3$ = 81.54.

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

71. (B) the definition of cash flows.

Explanation

The primary difference between the dividend discount models and the free cash flow from equity models lies in the definition of cash flows. The FCFE model uses residual cash flows after meeting all financial obligations and investment needs. The DDM uses a strict definition of cash flows to equity, that is, the expected dividends on the stock.

(Module 21.5, LOS 21.g)

Related Material

SchweserNotes - Book 3

72. (A) high growth in free cash flow for n years and then constant growth in free cash flow forever after.

Explanation

The two-stage model using either FCFE or FCFF typically assumes a high growth of free cash flow for *n* years and then a constant growth in free cash flow forever after. Multi-stage models assume that the required rate of return exceeds the growth rate in the last stage. In a two-stage free cash flow models, the growth rate in the second stage represents the long-run sustainable growth rate, which is generally a low rate that is close to the GDP growth rate.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

73. (A) $60,000,000.

Explanation

The value of equity is [($4,000,000)(1.05) / (0.12 – 0.05)] = $60,000,000.

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

74. (A) $3.56.

Explanation

FCFE year 0 = Earnings per share – [(Capital Expenditures – Depreciation) x (1 – Debt Ratio)] – [(Change in working capital) x (1 – Debt Ratio)]

= 5.00 – [(2.40 – 1.80) x (1 – 0.30)] – [(1.70) x (1 – 0.30)] = 3.39.

FCFE for year 1 = FCFE year 0 x (1 + growth rate) = 3.39 x (1.05) = $3.56.

(Module 21.5, LOS 21.m)

Related Material

SchweserNotes - Book 3

75. (A) $50.86.

Explanation

The value of the stock = $FCFE_1 / (r – g_n)$ = 3.56 / (0.12 – 0.05) = 50.86.

(Module 21.5, LOS 21.m)

Related Material

SchweserNotes - Book 3

76. (A) overvalued.

Explanation

Our calculated value of the stock = $FCFE_1 / (r – g_n)$ = 3.56 / (0.12 – 0.05) = $50.86. The current market price is $56.00, because the market price is greater than the estimated price, the stock is overvalued in the market.

(Module 21.5, LOS 21.m)

Related Material

SchweserNotes - Book 3

77. (C) greater than the total value of the firm.

Explanation

The total value of a firm is the total market value of equity plus the total market value of debt. The total value of equity is $56.00 per share x 5,000,000 shares = $280 million. Equity represents 70.0% of the capital structure. The total value of the firm is thus $280 million/0.70 = $400 million. An offer of $450 million is a premium of $50 million - a price greater than the current value of the firm.

(Module 21.5, LOS 21.m)

Related Material

SchweserNotes - Book 3

78. (B) the expected growth rate is too high for a stable firm.

Explanation

If the expected growth rate is too high for a stable firm, the value obtained using the stable-growth FCFE model will be extremely high.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

79. (B) $17.00.

Explanation

FCFE = CFO – FCInv + net borrowing = $49.50 – $40.00 + $7.50 = $17.00

(Module 21.4, LOS 21.d)

Related Material

SchweserNotes - Book 3

80. (A) Free cash flows to firm (FCFF).

Explanation

The FCFFs are normally unaffected by the changes in leverage, as these are the cash flows before the debt payments.

(Module 21.5, LOS 21.f)

Related Material

SchweserNotes - Book 3

81. (A) $87.50.

Explanation

Terminal value = FCFE / (k – g) = $5.25 / (0.11 – 0.05) = $87.50

(Module 21.5, LOS 21.l)

Related Material

SchweserNotes - Book 3

82. (B) growth is currently high and will move through a transitional stage to a steady-state growth rate.

Explanation

The three-stage model using either FCFE or FCFF typically assumes that growth is currently high and will move through a transitional stage to a steady-state growth rate. Multi-stage models assume that the required rate of return exceeds the growth rate in the last stage.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

83. (A) an increase in value due to interest tax shields.

Explanation

The amount of financial leverage used by a firm will affect its value. For small amounts of leverage, the additional bankruptcy risk will be low, and will be more than offset by the additional value of interest tax shields.

(Module 21.5, LOS 21.f)

Related Material

SchweserNotes - Book 3

84. (C) $6.90.

Explanation

In year 5, FCFE = Earnings per share – (Capital Expenditures – Depreciation) (1 – Debt Ratio) – (Change in working capital) (1 – Debt Ratio) = 8.10 – 0

(1 – 0.4) – 2.00(1 – 0.4) = 6.90.

(Module 21.4, LOS 21.d)

Related Material

SchweserNotes - Book 3

85. (A) remain the same.

Explanation

Share repurchases are a use of free cash flows, not a source. FCFF is cash flow that is available to all capital suppliers. Notice the conspicuous absence of repurchases in the following: FCFF = CFO + Int (1 – tax rate) – FCInv.

(Module 21.5, LOS 21.f)

Related Material

SchweserNotes - Book 3

86. (C) $74.10.

Explanation

Value of equity = $\$1.25 / (1.12)^1 + \$1.55 / (1.12)^2 + \$90.00 / (1.12)^2 = \$74.10$

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

87. (C) use changes that are based upon a working capital ratio that is closer to the industry average.

Explanation

The best solution is to use changes that are based upon a working capital ratio that approximates the industry average. The problem will not be eliminated by switching to a three-stage FCFE model.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

88. (B) the firm capital structure is static.

Explanation

A firm's target debt ratio is usually assumed to remain constant. Historical cash flows are generally projected forward with a growth rate.

(Module 21.5, LOS 21.e)

Related Material

SchweserNotes - Book 3

89. (C) control.

Explanation

Dividend policy can be changed by the buyer of a firm. Thus, the free cash flow perspective looks to the source of dividends in a position of control rather than directly at dividends.

(Module 21.1, LOS 21.b)

Related Material

SchweserNotes - Book 3

90. (C) $200,000.

Explanation

Brown's cash flow from operations (CFO) was $800,000 = ($900,000 Net Income + $300,000 depreciation - $400,000 gain).

Capital expenditure cash flows were –$3,000,000 for the factory and $2,400,000 cash received from sale of the old equipment for a net outflow of cash of $600,000.

$200,000 = ($800,000 - $600,000).

(Module 21.3, LOS 21.c)

Related Material

SchweserNotes - Book 3

91. (A) increase because the weighted average cost of capital will be lower due to interest tax shields.

Explanation

When a firm adds leverage, its value may increase due to the tax shields on interest expense and the generally lower cost of debt. In theory, there is an optimal capital structure. If the amount of debt employed is greater than the optimal, the costs

associated with risk of bankruptcy or financial distress begin to outweigh the advantage of interest tax shields.

(Module 21.5, LOS 21.f)

Related Material

SchweserNotes - Book 3

92. (B) Two-stage FCFF model.

Explanation

The two-stage FCFF model is most suited for analyzing firms growing at a rate faster than the overall economy. The two-stage model assumes a high rate of growth for an initial period, followed by an immediate jump to a constant, stable growth rate.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

93. (B) FCFs track profitability closely over the analyst's forecast horizon.

Explanation

FCF approaches are best when those flows are a good indication of a firm's profitability the analyst's forecast horizon.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

94. (A) $3.39.

Explanation

FCFE = Earnings per share – (Capital Expenditures – Depreciation) (1 – Debt Ratio) – Change in working capital (1 – Debt Ratio) = 5.00 – (2.40 – 1.80)

(1 – 0.3) – (1.7)(1 – 0.3) = 3.39.

(Module 21.5, LOS 21.e)

Related Material

SchweserNotes - Book 3

95. (A) The forecast of working capital as a percentage of revenues in the stable growth period is not large enough to maintain the long-term sustainable growth rate.

Explanation

The larger the estimate of working capital as a percentage of revenues, the larger the investment in net working capital, and the lower the FCFE in the stable period. A low stable-period FCFE estimate will result in a low estimate of value today. The solution is to use a working capital ratio closer to the long-run industry average.

If the cost of equity estimate in the stable growth period is too high, the terminal value will be too low. Because the terminal value typically makes up a large portion of the

current value, this will cause the current value estimate to be too low. The solution is to use a cost of equity estimate based on a beta of one.

If earnings are temporarily depressed, all the FCFE estimates will be low, and the current value estimate will be low. The solution is to use an estimate of long-run normalized earnings.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

96. (B) €3.80.

Explanation

Base-year FCFE = EPS – (capital expenditures – depreciation) x (1 – debt ratio) – increase in working capital x (1 – debt ratio)

= €4.50 – (€3.00 – €2.75) (1 – 0.30) – €0.75(1– 0.30) = €3.80.

(Module 21.5, LOS 21.e)

Related Material

SchweserNotes - Book 3

97. (C) €57.00.

Explanation

Value per share = (€3.80 x 1.05) / (0.12 – 0.05) = €57.00.

(Module 21.5, LOS 21.e)

Related Material

SchweserNotes - Book 3

98. (C) €82.40.

Explanation

Estimates for the future FCFE based on supplied growth rates are:

Year	0	1	2	3	4	5	6	7
Growth rate		12.5%	12.5%	12.5%	8.0%	6.5%	5.0%	3.0%
FCFE/share	€3.850	€4.331	€4.873	€5.482	€5.893	€6.335	€6.620	€6.818

Terminal value year 6 = 6.818/(12.0% – 3.0%) = €75.76

The nominal cash flow for year 6 is €75.76 + €6.62 = €82.38, which is the terminal cash flow plus the FCFE value for the year.

(Module 21.5, LOS 21.e)

Related Material

SchweserNotes - Book 3

99. (A) €60.70.

Explanation

Year	0	1	2	3	4	5	6	7
Growth rate		12.5%	12.5%	12.5%	8.0%	6.5%	5.0%	3.0%
FCFE/share	€3.850	€4.331	€4.873	€5.482	€5.893	€6.335	€6.620	€6.818

Terminal value year 6 = 6.818/(12.0% – 3.0%) = €75.76

For the calculator find NPV: CFO = 0, CF1 = €4.33, CF2 = €4.87, CF3 = €5.48, CF4 = €5.89, CF5 = €6.34, CF6 = €82.38, I/Y = 12. The result is €60.73.

(Module 21.5, LOS 21.e)

Related Material

SchweserNotes - Book 3

100. (C) Only FCFF from EBIT.

Explanation

$FCFF = EBITDA(1 – T) + (D \times T) – FC_{INV} – WC_{INV}$

Note that the formulae given in the question is incorrect as it adds back depreciation rather than the tax shield on depreciation. It should be noted that other NCC might need to be adjusted for in practice.

(Module 21.5, LOS 21.h)

Related Material

SchweserNotes - Book 3

101. (B) a constant growth model's price as of the beginning of the last stage.

Explanation

Terminal values are usually calculated as the present value of the price produced by a constant-growth model as of the beginning of the last stage.

(Module 21.5, LOS 21.l)

Related Material

SchweserNotes - Book 3

102. (B) have capital expenditures that are not significantly higher than depreciation.

Explanation

The stable-growth FCFF model is useful for valuing firms that are expected to have growth rates close to that of the overall economy. Since the rate of growth approximates that for the overall economy, these firms should have capital expenditures that are not significantly different than depreciation.

(Module 21.5, LOS 21.j)

SchweserNotes - Book 3

103. (C) FCFE divided by the total of required rate on equity minus growth.

Explanation

Terminal values are usually calculated as the present value of the price produced by a constant-growth model as of the beginning of the last stage, which is FCFE / (required rate on equity – growth).

(Module 21.5, LOS 21.I)

Related Material

SchweserNotes - Book 3

104. (A) $343 million.

Explanation

Under the stable growth FCFF model, the value of the firm = $FCFF_1$ / (WACC – g_n) = $30 million x (1.03) / (0.12 – 0.03) = $343.33 million.

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

105. (B) $346 million.

Explanation

The value of the firm is the present value of Year 1-3 plus the terminal value. The terminal value is: FCFF for year 4/(WACC – growth rate) = $40.62/(0.12 – 0.02) = $406.22 million in terms of year 3 dollars. The calculator inputs to solve NPV for the value of the firm is: CF0 = $0, CF1 = $18.90, CF2 = $23.64, CF3 = $29.09 + $406.22 = $435.31, I =12. NPV = $345.57 million.

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

106. (A) 13.0%.

Explanation

The weighted average cost of capital formula is WACC = w_d x r_d x (1 – t) + w_e x r_e. The weight of debt is 10.0% – the weight of equity must be 90.0%.

0.12 = 0.10 x 0.05 x (1 – 0.40) + 0.90 x r_e

0.120 – 0.003 = 0.90 x re

0.117/0.9 = re

r_e = 13.0%

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

107. (C) $15.75 per share

Explanation

The estimated market value of debt is $35 million, which represents 10.0% of the value of the firm. The other 90.0% is the value of equity or $315 million. $315 million/20 million shares = $15.75 per share.

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

108. (C) growing at a rate similar or less than the nominal growth rate of the economy.

Explanation

Companies growing at a rate similar to or less than the nominal growth rate of the economy are best suited for the Stable Growth FCFE Model. The three-stage FCFE model is most suited to analyzing firms currently experiencing high growth that will face increasing competitive pressures over time, leading to a gradual decline in growth to a stable level. The two-stage model is best suited to analyzing firms in a high growth phase that will maintain that growth for a specific period, such as firms with patents or firms in an industry with significant barriers to entry.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

109. (A) in high growth industries that will face increasing competitive pressures over time, leading to a gradual decline in growth to a stable level.

Explanation

The three-stage FCFE model, or E-Model, is most suited to analyzing firms currently experiencing high growth that will face increasing competitive pressures over time, leading to a gradual decline in growth to a stable level. The two-stage model is best suited to analyzing firms in a high growth phase that will maintain that growth for a specific period, such as firms with patents or firms in an industry with significant barriers to entry. Companies growing at a rate similar to or less than the nominal growth rate of the economy are best suited for the Stable Growth FCFE Model. A firm that pays out all of its earnings as dividends will have a growth rate of zero (remember g = RR x ROE) and would not be valued using the three-stage

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

110. (B) $750M.

Explanation

The value of the firm's equity is: $50M x 1.05 / (0.12 – 0.05) = $750M

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

111. (C) Cost of equity.

Explanation

Free cash flow to equity valuation uses the opportunity cost relevant to stockholders, which is the cost of equity.

(Module 21.1, LOS 21.a)

Related Material

SchweserNotes - Book 3

112. (B) net income plus non-cash charges plus after-tax interest.

Explanation

The answer is indicated by the definition of FCFF: FCFF = NI + NCC + Int (1 – tax rate) – FCInv – WCInv. The relationship between net income and FCFF is indicated by: NI = EBIT (1 – tax rate) – Int (1 – tax rate).

(Module 21.5, LOS 21.h)

Related Material

SchweserNotes - Book 3

113. (A) present value (PV) of FCFE during the extraordinary growth period plus the PV of terminal value.

Explanation

The value of stock under the two-stage FCFE model will be equal to the present value of FCFE during the extraordinary growth period plus the present value of the terminal value at the end of this period.

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

114. (C) Two-stage free cash flow to equity (FCFE).

Explanation

The two-stage FCFE model is well suited to value a firm that is currently experiencing high growth and will likely see this growth drop to a lower, more stable rate in the future.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

115. (B) The value will decrease.

Explanation

Everything else being constant, an increase in the relevant required rate of return should decrease the value of the firm.

(Module 21.5, LOS 21.i)

Related Material

SchweserNotes - Book 3

116. (C) increase due to the additional value of interest tax shields.

Explanation

For small changes in leverage, the additional value added by the interest tax shields will more than offset the additional risk of bankruptcy / financial distress. Given the tax advantage of debt, the firm's WACC should decline, not increase with small changes in leverage.

(Module 21.5, LOS 21.f)

Related Material

SchweserNotes - Book 3

117. (C) $5.90.

Explanation

FCFF = EPS + net non-cash charges + after-tax interest – FCInv – WCInv

FCFF= $4.00 + 3.00 +$2.40 – $2.00 –1.50 = $5.90

(Module 21.4, LOS 21.d)

Related Material

SchweserNotes - Book 3

118. (C) after-tax EBIT plus non-cash charges.

Explanation

The answer is indicated by the definition of FCFF: FCFF = EBIT (1 – tax rate) + Dep – FCInv – WCInv, which assumes that depreciation is the only non-cash charge. Further: FCFF = NI + NCC + Int (1 – tax rate) - FCInv - WCInv.

(Module 21.5, LOS 21.h)

Related Material

SchweserNotes - Book 3

119. (B) 8.0%.

Explanation

The firm's estimated earnings growth rate is the product of its retention ratio and ROE:

g = RR x (ROE) = [(600 – 120) / 600] x (600 / 6000) = 0.08

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

120. (C) $420M.

Explanation

Since working capital needs are negligible, the free cash flow to equity is:

FCFE = Net income – [1 – DR)] x [FClnv - Depreciation] – [(1 – DR) x WClnv]

FCFE = 600M – [1 – 0.4] x (800M – 500M) = 420M

where:

DR = target debt to asset ratio

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

121. (B) 15.0%.

Explanation

Value of equity = $FCFE_1$/(Cost of equity – growth rate); so $6,000 = [$420/(Cost of equity – 0.08)]

(Cost of equity - 0.08) x $6,000 = $420

Cost of equity – 0.08 = 0.07

Cost of equity = 0.15 = 15.0%

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

122. (C) 11.74%.

Explanation

Cost of equity = $r_f + (r_m – r_f)$ = 0.05 + 1.056(0.10) = 0.05 + 0.1056 = 0.1556

The best approximation for cost of debt is the interest expense divided by the market value of the debt.

Cost of debt = Interest expense/market value of debt = $400 million/$4.0 billion = 0.10

WACC = $w_d \times r_d$ x (1 – t) + we x re = 0.40 x 0.10 x (1 – 0.40) + 0.60 x 0.1556 = 0.1174

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

123. (B) are in an industry with significant barriers to entry.

Explanation

The two-stage FCFE model is suitable for valuing firms in industries with significant

barriers to entry. Where these are present it is possible for the firm to maintain a high growth rate during an initial phase of low competition, and that the rate will drop sharply to a normalized rate when competition ultimately appears.

(Module 21.5, LOS 21.j)

Related Material

SchweserNotes - Book 3

124. (A) $540M.

Explanation

The free cash flow to the firm is:

FCFF = Net income + (Interest expense)(1 – T) – Capital expenditures + Depreciation

600M + 400M(1 – 0.40) – 800M + 500M = 540M

(Module 21.4, LOS 21.d)

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125. (B) $1,077M.

Explanation

The value of the firm's equity is equal to the value of the firm minus the value of the debt. Firm value = $80M x 1.03 / (0.10 – 0.03) = $1,177M, so equity value is $1,177M – $100M = $1,077M.

(Module 21.5, LOS 21.k)

Related Material

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126. (C) FCFE is greater than dividends, and the excess is not invested in zero NPV projects.

Explanation

The estimate of value from FCFE models will always be different from the value obtained using DDM, if the FCFE is greater than dividends, and the excess cash is not invested in zero NPV projects.

(Module 21.5, LOS 21.g)

Related Material

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127. (C) significantly higher than that of the overall economy.

Explanation

The two-stage FCFF model is more useful in valuing a firm that is growing at a rate significantly higher than the overall economy. Since this cannot persist indefinitely, growth will eventually slow to a stable growth rate consistent with that of the economy.

(Module 21.5, LOS 21.j)

Related Material

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128. (A) the firm's cost of capital.

Explanation

The optimal capital structure is the mix of debt and equity that will maximize the value of the firm and minimize weighted average cost of capital (i.e. the firm's cost of capital or "WACC").

(Module 21.5, LOS 21.f)

Related Material

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129. (A) $2.39 million.

Explanation

The FCFF for the current year is [$6.00m x (1 – 0.40)] + $0.63m – $1.25m - $0.59m = $2.39m.

(Module 21.5, LOS 21.k)

Related Material

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130. (A) $50 million.

Explanation

The value of BIC using a stable-growth FCFF model is $49.95 million, calculated as:

FCFF = [$6.00m x (1 – 0.40)] + $0.63m – $1.25m - $0.59m. = $2.39m

WACC = (0.60 x 0.16) + [0.40 x 0.105 x (1 x 0.40)] = 12.12%.

Estimated value = ($2.39m x 1.07) / (0.1212 - 0.07) = $49.95 million.

(Module 21.5, LOS 21.k)

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131. (C) $61.

Explanation

FCFE = FCFF – Interest expense x (1 – tax rate) + Net borrowing = $2.40 million – [$2.00 million x (1 - 0.40)] + $3.30 million - $2.85 million = $1.65 million.

The value of equity is: [$1.65 million x (1 + 0.10)] /(0.16 – 0.10) = $30.25 million.

On a per share basis: $30.25 million/500,000 = $60.50

(Module 21.5, LOS 21.k)

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132. (A) overvalued.

Explanation

FCFE = FCFF – Interest expense x (1 – T) + New borrowing.

Year	0	1	2	3	4
Growth rate		25.0%	25.0%	25.0%	6.0%
FCFE in mil$	$1.750	$2.188	$2.732	$3.418	$3.623

The terminal value is $3,623/(0.16 – 0.06) = $36,230 million. The calculator inputs: CFO = 0, CF1 = $2,188, CF2 = $2,734, CF3 = $3,418 + $36,230 = $39,648, I = 16, NPV = $29.319 million.

Per share price is $29,319,000/500,000 = $58.64. The stock appears to be overvalued at the current market price of $62.50 per share, as our estimated value of $58.64 suggests that the market price is too high.

(Module 21.5, LOS 21.k)

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133. (C) £85,000.

Explanation

CFO = NI + NCC – WCINv

Non-Cash Charges	
+ Depreciation	14,000
– Gain on asset disposal	(20,000)
+ ΔDeferred tax liability	10,000
Net impact	4,000

Working Capital Investment		
	20x9	20x8
CA – cash and investments	30,000	32,000
CL – debt instruments and dividends payables	44,000	40,000
Working capital	(14,000)	(8,000)
Δ in working capital	– £6,000	

Note that the change in the deferred tax liability (DTL) is only included, as it is not expected to reverse. A DTL that is expected to reverse in the near term would be ignored. Whilst the DTL represents a boost to operating cash flows when it is created, it will reduce cash flows when it reverses. These two cash flow effects off set and as a result, it is best to ignore the DTL when estimating free cash flow if it is expected to reverse in the short run.

CFO = 75,000 + 4,000 + 6,000 = £85,000

(Module 21.4, LOS 21.d)

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134. (A) £20,000.

Explanation

FC_{INV} = change in carrying value + dep^n expense – gain on disposal

FCINV = 26,000 + 14,000 – 20,000 = 20,000

Alternatively

Compute additions to PP&E as a residual figure:

FC_{INV} computation

PP&E 20x8	202,000	Proceeds (plug)	30,000
Depreciation	(14,000)	Carrying value	(10,000)
Disposal	(10,000)	Gain/(loss)	20,000
Additions (plug)	50,000		
PP&E 20X9	228,000		
FCINV = £50,000 – £30,000 = £20,000			

Note that additions and proceeds have been computed as residual (balancing) figures.

(Module 21.4, LOS 21.d)

Related Material

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135. (A) £55,600.

Explanation

FCFF = CFO + interest (1 – T) – FC_{INV}

FCFF = £75,000 + £1,000 (1 – 0.4) – £20,000 = £55,600

(Module 21.4, LOS 21.d)

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136. (B) £3,075,000.

Explanation

CF2 = £94,080

CF3 = £105,370

CF4 = £118,014 + £708,084 + £3,068,364

I = 8 CPT → NPV = £3,104,628

Firm value = £3,104,628

Equity value = firm value – debt value

£3,074,628 = £3,104,628 – £30,000

(Module 21.5, LOS 21.k)

Related Material

SchweserNotes - Book 3

137. (A) Both.

Explanation

Concern 1: He is correct that declines in inventory give one off boosts to cash flow from operations and hence free cash flow. In addition, it is unlikely that Fishy Discs inventory will decline in future periods given we are expecting growth of 12% in the near term.

Concern 2: The corporate finance firm are using a three-stage model with declining growth after four years. The model takes six years for growth to decline to sustainable levels. Given that Fishy Discs will lose its exclusivity agreement with the U.S. producer in four years, it is likely that the decline in growth will be far more rapid. Once barriers to entry are removed growth will decline from 12% to 4% far more rapidly than is being modelled. For companies that sustain economic profit due barriers to entry such as patents, copyrights and other agreements using a two stage model may model the decline in growth due to an influx in competition more accurately.

(Module 21.5, LOS 21.j)

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