CHAPTER 20

DISCOUNTED DIVIDEND VALUATION

1. (C) Profitable rapidly-growing companies.

Explanation

A discounted dividend approach is suitable for valuing a dividend-paying stock where there is a clear and direct relationship between the company's dividends and its profitability. Analysts also sometimes use the Gordon growth model to value broad developed-market equity indexes. The Gordon growth model is generally inappropriate for valuing a profitable rapidly-growing firm, which is likely to not pay a dividend, or which may possess supernormal growth that cannot be expected to continue. A firm that does not pay a dividend is likely to be valued based on free cash flow.

(Module 20.2, LOS 20.e)

Related Material

SchweserNotes - Book 3

2. (B) $36.47.

Explanation

The current value is $36.47.

V_0 = ($2.22 / 0.08) + $8.72 = $36.47

(Module 20.2, LOS 20.g)

Related Material

SchweserNotes - Book 3

3. (C) 10.42%.

Explanation

The value per share using the new estimates is $35.33 = [$2.0(1.06) / 0.12 - 0.06)] and the percentage increase in the value per share will be 10.42%

= [(35.33 - 32.00) / 32.00] x 100%.

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

4. (A) stable period payout ratio may be too high resulting in an extremely low value.

Explanation

If the stable period payout ratio is too low it may result in an extremely low value because the terminal value will be lower due to the smaller dividends being paid out.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

Bernadine Nutting has just completed several rounds of job interviews with the valuation group, Ancis Associates. The final hurdle before the firm makes her an offer is an interview with Greg Ancis, CFA, the founder and senior partner of the group. He takes pride in interviewing all potential associates himself once they have made it through the earlier rounds of interviews, and puts candidates through a grueling series of tests. As soon as Nutting enters his office, Ancis tries to overwhelm her with financial information on a variety of firms, including Turbo Financial Services, Aultman Construction, and Reality Productions.

Ancis then moves on to Turbo Financial Services. Ancis has been following Turbo for quite some time because of its impressive earnings growth. Earnings per share have grown at a compound annual rate of 19% over the past six years, pushing earnings to $10 per share in the year just ended. He considers this growth rate very high for a firm with a cost of equity of 14%, and a weighted average cost of capital (WACC) of only 9%. He's especially impressed that the firm can achieve these growth rates while still maintaining a constant dividend payout ratio of 40%, which he expects the firm to continue indefinitely. With a market value of $55.18 per share, Ancis considers Turbo a strong buy.

Ancis believes that Turbo will have one more year of strong earnings growth, with EPS rising by 20% in the coming year. He then expects EPS growth to fall 5 percentage points per year for each of the following two years, and achieve its long-term sustainable growth rate of 5% beginning in year four.

Finally, Ancis turns to Aultman Construction, trading at $22 per share (with current EPS of $2.50 and a required return of 18%), and Reality Productions, which currently trades at $30 per share. Reality Production's current dividend is $1.50, but the historical dividend growth rate has been a stable 10%. Dividend growth is expected to decline linearly over six years to 5%, and then remain at 5% indefinitely.

5. (A) are in an industry with low barriers to entry.

Explanation

The two-stage DDM is well suited to firms that have high growth and are expected to maintain it for a specific period. The assumption that the growth rate drops sharply from high-growth in the initial phase to a stable rate makes this model appropriate for firms that have a competitive advantage, such as a patent, that is expected to exist for a fixed period of time. The model is not useful in analyzing a firm that is in an industry with low barriers to entry. Low barriers to entry are likely to result in increased competition. Therefore, the length of the initial phase of the growth period is indeterminate and probably uneven.

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

6. (B) 11.00%.

Explanation

The H-model applies to firms where the dividend growth rate is expected to decline linearly over the high-growth stage until it reaches its long-run average growth rate. This most closely matches the anticipated pattern of growth for Reality Productions.

The H-model can be rewritten in terms of r and used to solve for r given the other model inputs:

$$r = D_0 / P_0 \times \left[\left(1 + g_L\right) \times \left[H \times \left(g_S - g_L\right) \right] \right] + g_L$$

Here, r = 1.5 / 30 x [(1 + 0.05) + [(6.0 / 2) x (0.10 - 0.05)] + 0.05 = 0.11

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

7. (A) 4.0%.

Explanation

The implied long-term rate is the rate that will cause the present value of expected dividends to equal its current market value. Since Ancis provides specific growth rates for Turbo over the next three years, we can use a multi-stage dividend discount model and solve for the long-term growth rate that makes the present value equal to the current market value.

First, we calculate Turbo's expected dividends.

D_0 = $10.00 current EPS times the dividend payout ratio of 40%

D_0 = $4.00 dividend per share in year 0.

Note that the 19% historical dividend growth rate is irrelevant to the current value of the firm. Since the dividend payout ratio is expected to remain constant at 40%, we can use the expected growth rate in earnings to estimate future dividends. EPS growth is forecast at 20% in year 1, 15% in year 2, and 10% in year 3.

Multiplying each year's expected dividend times the relevant forecast growth rate, we calculate:

D_1 = ($4.00 dividend in year 0) x (1.20) = $4.80

D_2 = ($4.80 dividend in year 1) x (1.15) = $5.52

D_3 = ($5.52 dividend in year 2) x (1.10) = $6.07

Discounting these back to their present value in year 0 using the cost of equity (the WACC is irrelevant), we find:

Present Value ($D_1 + D_2 + D_3$) = ($4.80 / 1.14^1) + ($5.52 / 1.14^2) + ($6.07 / 1.14^3)

= $4.21 + $4.25 + $4.10

= $12.56

Thus, we know that $12.56 of the current $55.18 market value represents the present value of the expected dividends in years 1, 2 and 3. Therefore, the present value of the firm's dividends for years 4 and beyond must equal ($55.18 - $12.56) = $42.62.

Since the present value of the firm's dividends beginning in year 4 equals $42.62, the future value in year four will equal ($42.62 x 1.14^3) = $63.14.

Now that we know the value in year 4 of the future stream of steady-growth dividends, we can solve for the growth rate using the Gordon Growth Model:

$P_3 = [(\$6.07)(1 + x)] / (0.14 - x) = \$63.14$

$63.14 (0.14 - x) = 6.07 (1 + x)$

$8.84 - 63.14x = 6.07 + 6.07x$

$2.77 = 69.21x$

$x = 0.04$

The long-term growth rate that makes Turbo fairly valued is 4% per year.

We can check our calculation by plugging the 4% growth rate we just solved for into the Gordon Growth Model and then plugging that result into the basic multi-stage dividend discount model:

$P_3 = [(\$6.07)(1 + 0.04)] / (0.14 – 0.04)$

$P_3 = 6.313 / (.10)$

$P_3 = 63.13$

(Note that this value varies from the previous calculation by 0.01 because of rounding error.)

P_0 = ($4.80 / 1.14^1) + ($5.52 / 1.14^2) + ($6.07 / 1.14^3) + ($63.13 / 1.14^3) = $55.18, which is the current market value. At a 4% growth rate, Turbo is fairly valued.

Note that on the exam, it may be faster to plug each growth rate into the Gordon Growth Model and then plug each of those terminal values into the basic multi-stage formula than to solve for the growth rate. This trial and error method is especially effective if you start with the "middle" growth rate and then decide which value to test next depending on the results of the first calculation. For example, if the first growth rate gives a value for the firm that is too high, you can eliminate all the higher growth rates and try the next lower one.

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

8. (C) 36.9%.

Explanation

The present value of the company's future investment opportunities is also known as PVGO, which can be calculated using the formula:

Value = (E / r) + PVGO

where

E = earnings per share

r = required return

(E / r) is the value of the assets in place

Here, $22 = ($2.5 / 0.18) + PVGO

PVGO = $8.11

The PVGO as a percentage of the market price equals ($8.11 / $22.00)

= 36.9%.

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

9. (B) 7.2%.

Explanation

The required return on an asset is equal to the current expected risk-free return, plus the asset's beta times the difference between the expected return on the equity market and the risk-free rate. Required return = 0.03 + 0.6(0.10 - 0.03)

= 0.072 or 7.2%.

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

10. (B) 13.85%.

Explanation

Cantel's ROE is 13.85%:

ROE = 11% / [1 — ($3.50/$17.00)] = 13.85%

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

11. (C) 9.8%.

Explanation

The required rate of return is 9.8%.

r = ($2/$45) [(1 + 0.05) + (3/2)(0.07 — 0.05)] + 0.05 = 0.0980

Since the H-model is an approximation model, it is possible to solve for r directly without iteration.

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

12. (C) 14.8%.

Explanation

Sustainable growth rate = ROE x retention rate

Earnings per share = price / (P/E) = $134 / 25.6 = $5.23 0°)

The retention rate represents the portion of earnings not paid out in dividends.

= (5.23 - 0.55) / 5.23 = 0.89 or 89%

ROE = profit margin x asset turnover x financial leverage

ROE = 5.23 / 1198 x 11.2 x 3.4 = 16.6%

Sustainable growth rate = 89% x 16.6% = 14.8%

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

13. (B) correctly valued.

Explanation

The value per share using the estimates is $52.50 = [$3.00(1.05) / 0.11 - 0.05)].

(Module 20.3, LOS 20.j)

Related Material

SchweserNotes - Book 3

14. (A) equity premium.

Explanation

Beta measures the correlation between the equity market or index for which the market risk premium is calculated and the particular asset being valued. Beta is used to approximate the proportion of the equity risk premium applicable to the asset (in relation to the market or index used).

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

15. (A) $9.42.

Explanation

The first step is to determine the required rate of return as 4% + [(10% – 4%) x 0.76] or 8.56% per year. The second step is to determine the present value of all future expected cash flows, including the terminal $10 stock price, discounted back four years to today. The solution is shown below.

Year	CF
1	0
2	0
3	1
4	2
4	10

$0/1.0856 + 0/(1.0856)^2 + 1/(1.0856)^3 + (2 + 10)/(1.0856)^4 = \$9.42$

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

16. (C) 12.7%.

Explanation

The required rate of return is 12.7%.

r = ($3 / $50)[(1 + 0.06) + (4 / 2)(0.09 - 0.06)] + 0.06 = 12.7%

Since the H-model is an approximation model, it is possible to solve for r directly without iteration.

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

17. (A) $71.38.

Explanation

The dividends in the next four years are:

Year 1: 6 x 0.4 = 2.4

Year 2: 9 x 0.4 = 3.6

Year 3: 13.5 x 0.4 = 5.4

Year 4: (13.5 x 1.02) x 0.8 = 11.016

The terminal value of the firm (in year 3) is 11.016 / (0.12 - 0.02) = 110.16. Value per share = $2.4 / (1.2)^1 + 3.6 / (1.2)^2 + 5.4 / (1.2)^3 + 110.16 / (1.2)^3$

= $71.38.

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

18. (B) $38.63.

Explanation

The dividend for year 5 is expected to be $3 ($6 times 50%). The dividend for year 6 is then expected to be $3.00 x 1.03 = $3.09. The terminal value using the Gordon growth model is therefore:

terminal value = 3.09 / (0.11 - 0.03) = $38.625

$P_5 = D_6 / (k - g)$

(Module 20.3, LOS 20.m)

Related Material

SchweserNotes - Book 3

19. (A) modern research has shown that many of the old standbys do not work.

Explanation

The DDM requires assumptions that many analysts find impractical. In addition, the model lacks the flexibility to adapt to changing circumstances. Both of these problems can be overcome, to a large extent, by using spreadsheet modeling to forecast cash flows and other variables.

(Module 20.3, LOS 20.o)

Related Material

SchweserNotes - Book 3

20. (A) Initial growth stage.

Explanation

During the initial growth stage, the firm is able to exploit opportunities to earn greater than the required return. During this stage, earnings are reinvested in the growth opportunities rather than returned to the investors.

(Module 20.3, LOS 20.k)

Related Material

SchweserNotes - Book 3

21. (B) $31.58.

Explanation

The PVGO is $31.58:

PVGO = $42 — ($1.25 / 0.12) = $31.58

(Module 20.2, LOS 20.g)

Related Material

SchweserNotes - Book 3

22. (A) 5.5%.

Explanation

Equity risk premium = forecasted dividend yield + consensus long term earnings growth rate — long-term government bond yield.

Therefore,

Consensus long term earnings growth rate =

Equity risk premium – forecasted dividend yield + long-term government bond yield

Consensus long term earnings growth rate = 3.5% - 2.5% + 4.5% = 5.5%

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

23. (A) $147.

Explanation

The value of the preferred is $147:

V_0 = ($100par x 11%) / 7.5% = $146.67

(Module 20.2, LOS 20.d)

Related Material

SchweserNotes - Book 3

24. (C) utilities.

Explanation

Gordon growth model is best suited to firms that have a stable growth comparable to or lower than the nominal growth rate in the economy and have well established dividend payout policies. Utilities, with their regulated prices, stable growth and high dividends, are particularly well suited for this model.

(Module 20.2, LOS 20.e)

Related Material

SchweserNotes - Book 3

25. (B) $129.60.

Explanation

The current value of Hapex shares is $129.60:

V_0 = [$6(1 + 0.05) + $6(2/2)(0.08 — 0.05)] / (0.10 — 0.05) = $129.60

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

26. (C) 6%.

Explanation

The required rate of return is 6%: V_0 = ($100par x 8%) / r = $134, r = 5.97%

(Module 20.2, LOS 20.d)

Related Material

SchweserNotes - Book 3

27. (A) a firm has low or no dividends currently.

Explanation

The H model is useful for firms that are growing rapidly but the growth is expected to decline gradually over time as the firm gets larger and faces increased competition. The assumption of constant payout ratio makes the model inappropriate for firms that have low or no dividend currently.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

28. (C) 9%.

Explanation

The equation to determine the required rate of return is solved through iteration.

$\$54.50 = \$2(1.07)/(1 + r) + \$2(1.07)^2/(1 + r)^2 + \{ [\$2(1.07)^2(1.05)]/(r - 0.05)\} / [(1 + r)^2]$

Through iteration, r = 9%

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

29. (B) 15.68%.

Explanation

We have the price and dividend. We need the required rate of return to use the Gordon Growth model to calculate implied dividend growth. Using the capital asset pricing model, the required return = risk-free rate + (beta x equity risk premium) = 17.72%.

Price = [dividend x (1 + dividend growth rate)] / [required return - dividend growth rate]

18.12 = [0.32 x (1 + dividend growth rate)] / [0.1772 - dividend growth rate]

18.12 x [0.1772 - dividend growth rate] = 0.32 + 0.32 x dividend growth rate

3.2112 – 18.12 x dividend growth rate = 0.32 + 0.32 x dividend growth rate

2.8912 = 18.44 x dividend growth rate

1 = 6.3779 × dividend growth rate

Dividend growth rate = 15.68%

(Module 20.3, LOS 20.f)

Related Material

SchweserNotes - Book 3

30. (C) 13%.

Explanation

The required return = [($36.00 + $2.80) / $34.34] – 1 = 0.13 or 13%.

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

31. (C) 16.62%.

Explanation

g = [1 - ($2 / $26)]0.18 = 16.62%

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

32. (A) $0.56.

Explanation

The PVGO is $0.56:

PVGO = $41 — ($3.64 / 0.09) = $0.56

(Module 20.2, LOS 20.g)

Related Material

SchweserNotes - Book 3

33. (C) Two-stage dividend discount model.

Explanation

The two-stage DDM has the limitation that a sudden decrease to the lower growth rate in the second stage may not be realistic. Further, the model has the difficulty in trying to estimate the length of the high-growth stage.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

34. (B) 9%.

Explanation

The required return is 9%: r = [$1.22(1 + 0.05) / $32.03] + 0.05 = 0.09 or 9%.

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

35. (A) Limiting deviations from the core model.

Explanation

The whole point of scenario analysis is the flexibility to modify the inputs to see how changes in one factor affect others. In order to perform scenario analysis, you must deviate from the core model. Increased precision on the inputs will increase the predictive power of almost any model. Spreadsheets reduce the likelihood of computational inaccuracies and allow analysts to more easily modify models to reflect many scenarios.

(Module 20.3, LOS 20.o)

Related Material

SchweserNotes - Book 3

36. (A) $92.23.

Explanation

D_1 = Year 1 dividend (after one year of 8% growth) = $4 x (1 + 0.08) = $4.32

PV(D_1) = $4.32/(1+10%) = $3.93

D_2 = Year 2 dividend (after two years of 8% growth) = $4 x $(1 + 0.08)^2$ = $4.67

PV(D_2) = $4.67/$(1 + 10%)^2$ = $3.86

H-Model value as of the end of year 2

$= D_0 \times (1 + g_L) / (r - g_L) + D_0 \times H \times (g_S - g_L) / r - g_L$

= $4.67 x (1 + 5%)/(10% – 5%) + $4.67 x (3/2) x (8% – 5%)/(10% - 5%)

= $102.18

PV(H-model) = $102.17664/(1.10)^2$ = $84.44

Total current value of Triple Crown shares:

V_0 = PV(D_1) + PV(D_2) + PV(H-model) = $3.93 + $3.86 + $84.44 = $92.23

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

37. (B) $29.78.

Explanation

The terminal value is $29.78, and that is the price an investor should be willing to pay at the end of year 2. The correct answer is shown below.

Year	Dividend
1	$1.0600
2	$1.1236
3	$1.1910

V_2: $1.191/(0.10 — 0.06) = $29.78

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

38. (B) $22.00.

Explanation

The Gordon growth model is used to value stocks based on a future series of dividends that grow at a constant rate.

The current value of the shares is $22.00:

$V_0 = D_0 \times (1 + g) / (r - g)$

= [$1.00(1 + 0.10)] / (0.15 – 0.10)]

= $22.00

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

39. (B) $30.60.

Explanation

First estimate the amount of each of the next two dividends and the terminal value. The current value is the sum of the present value of these cash flows, discounted at 8.5%.

$$V_0 = \frac{1.20}{1.085} + \frac{1.44}{(1.085)^2} + \frac{1.04(1.44)}{(0.085-0.04)(1.085)^2}$$

$V_0 = 30.60$

(Module 20.1, LOS 20.b)

Related Material

SchweserNotes - Book 3

40. (B) 1 – (dividends / earnings).

Explanation

Earnings retention rate = 1 – (dividends / earnings).

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

41. (C) overvalued.

Explanation

The Gordon Growth model is as follows:

Value = [dividend x (1 + dividend growth rate)] / [required return - growth rate]

Value = [2.15 x 1.05] / [0.095 – 0.05]

= 2.2575 / [0.095 – 0.05]

= 50.17

(Module 20.3, LOS 20.j)

Related Material

SchweserNotes - Book 3

42. (C) 11.9.

Explanation

The justified trailing P/E is 11.9:

$P_0 / E_0 = [(\$0.75)(1 + 0.11)/\$3.50] / (0.13 — 0.11) = 11.8929$

(Module 20.2, LOS 20.h)

Related Material

SchweserNotes - Book 3

43. (A) $18.73.

Explanation

The current value of the shares is $18.73:

$V_0 = \$1.00 / 1.14 + \$1.20 / (1.14)^2 + \$22.00 / (1.14)^2 = \$18.73$

(Module 20.1, LOS 20.b)

Related Material

SchweserNotes - Book 3

44. (B) market price.

Explanation

The required rate of return is implicit in the asset's market price and can be determined with the present value of growth opportunities.

(Module 20.2, LOS 20.g)

Related Material

SchweserNotes - Book 3

45. (C) Terminal value estimate is most sensitive to estimates of future dividends.

Explanation

The Terminal value in two-stage DDM is most sensitive to estimates of growth and required rate of return.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

46.

	P/E multiple	DDM
(C)	96.00	89.14

Explanation

Terminal Value

$= P/E \times EPS$

$= 8 \times 12 = 96$

$D_{10} = 0.5 \times 12 = 6$

$g = 0.50 \times 0.08 = 4\%$

$$P_{10} = \frac{D_{10}(1+g)}{r-g}$$

$$= \frac{6(1.04)}{(0.11-0.04)}$$

$= 89.14$

(Module 20.3, LOS 20.m)

Related Material

SchweserNotes - Book 3

47. (C) a growth rate closer to that of gross domestic product (GDP).

Explanation

A firm cannot, in the long term, grow at a rate significantly greater than the growth rate of the economy in which it operates. If the growth rate in dividends is too high, then it is best replaced by a growth rate closer to that of GDP.

(Module 20.2, LOS 20.e)

Related Material

SchweserNotes - Book 3

48. (A) overstating the value of the firm.

Explanation

Applying the Gordon growth model to such a firm would result in an estimate of value based on the assumption that the supernormal growth would continue indefinitely. This would overstate the value of the firm.

(Module 20.2, LOS 20.e)

Related Material

SchweserNotes - Book 3

49. (B) inflating the mean return.

Explanation

Survivorship bias refers to the weeding out of underperforming firms, resulting in an inflated value for the mean return.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

50. (B) $29.21.

Explanation

The current value of the shares is $29.21:

$V_0 = (\$1.25 / 1.12) + (\$1.35 / (1.12)^2) + (\$1.45 / (1.12)^3) + (\$36.50 / (1 + 0.12)^3) = \$29.21$

(Module 20.1, LOS 20.b)

Related Material

SchweserNotes - Book 3

51. (B) $3.15.

Explanation

The first step is to determine 2002 dividends paid as ($8,000,000 + $5,000,000 - 10,000,000) = $3,000,000. The next step is to find the dividend per share ($3,000,000 / 1,000,000 shares) = $3.00 per share. Applying the 5% growth rate, next year's expected dividend is $3.15, or $3.00 x 1.05.

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

52. (A) three-stage dividend discount model (DDM).

Explanation

Most of high-tech firms grow at very high rates and are expected to grow at those rates for an initial period. These rates are expected to decline as the firm grows in size and loses its competitive advantage. Of the models provided, the three-stage DDM is most appropriate to analyze high-tech firms because of its flexibility. H-model may not be appropriate, because a linear decline from the high growth rate to the constant growth rate cannot be assumed and the dividend payout ratio is fixed.

(Module 20.3, LOS 20.l)

Related Material

SchweserNotes - Book 3

53. (B) Mature stage.

Explanation

As a firm matures, the forces of competition begin to deny it opportunities to earn greater than the required return. Faced with this situation, most earnings are distributed to shareholders as dividends. An alternate way of returning capital is through stock repurchases.

(Module 20.3, LOS 20.k)

Related Material

SchweserNotes - Book 3

54. (C) -$5.00.

Explanation

Share price = (no-growth earnings / required return) + PVGO

35 = (4 / 0.10) + PVGO

PVGO = –$5.00

(Module 20.2, LOS 20.g)

Related Material

SchweserNotes - Book 3

55. (A) growth rate in the stable growth period is probably too high.

Explanation

If the three-stage DDM results in an extremely high value, either the growth rate in the stable growth period is too high or the period of growth (high plus transition) is too long. To solve these problems, an analyst should use a growth rate closer to GNP growth and use shorter high-growth and transition periods.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

56. (C) 20.0%.

Explanation

SGR

= ROE x [(net income – dividends) / net income]

= (15 million / 50 million) x (15 million – 5 million) / 15 million

= 20.0%

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

57. (B) required rate of return.

Explanation

Just as we can determine the current value of the shares from the current dividends, growth forecasts and required return, we can solve for any one of them if we know the other three factors.

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

58. (B) high growth, a transitional period of declining growth and a final stable growth phase.

Explanation

The three-stage DDM combines the features of the two-stage DDM and the H model. It allows for an initial period of high growth, a transitional period of declining growth and a final stable growth phase.

(Module 20.3, LOS 20. l)

Related Material

SchweserNotes - Book 3

59. (C) $2.50.

Explanation

The earnings can be determined by solving for earnings in the sustainable growth formula:

9% = [1 - ($1 / $Earnings)] x 0.15 or $1 / 0.4 = $ Earnings = $2.50

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

60. (C) $43.49.

Explanation

CAPM:

$r = 0.04 + [0.95 \times (0.11 - 0.04)] = 0.1065$

$D_3 = D_1 \times (1 + g)^2 = \$1.80 \times 1.06^2 = \$2.0225$

$P_2 = \frac{D_3}{r - g} = \frac{\$2.0225}{0.1065 - 0.06} = \$43.49$

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

61. (A) Gordon growth model.

Explanation

The Gordon growth model would not be appropriate for a firm with two stages of growth but is useful to value a firm with steady slow growth.

(Module 20.2, LOS 20.e)

Related Material

SchweserNotes - Book 3

62.

(C)	Three-stage	Two-stage

Explanation

Middle Hickory is in the initial-growth phase, while Lower Elm is in the transition phase. The three-stage model is appropriate for new, fast-growing companies. The two-stage model is appropriate for companies in the transitional phase.

(Module 20.3, LOS 20.l)

Related Material

SchweserNotes - Book 3

63. (A) Free cash flow to firm (FCFF).

Explanation

FCFF is another discounted cash flow model, not a method to determine required returns. Each of the other answers is a valid approach to determining an appropriate discount rate.

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

64. (C) 10.7%.

Explanation

g = (1 — 1/3)(0.16) = 0.107

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

65. (C) 8.00%.

Explanation

The Gordon DDM uses the dividend for the period (t + 1) which would be $1.05.

$35 = $1.05 / (required return — 0.05)

Required return = 0.08 or 8.00%

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

66. (B) limits its usefulness in estimating the required return of an asset.

Explanation

There are several characteristics of the CAPM that limit its usefulness in determining the required returns, including the uncertainty whether we should use arithmetic or geometric means as the appropriate measure of long-term average returns.

(Module 20.1, LOS 20.b)

Related Material

SchweserNotes - Book 3

A team of analysts at WSM investments are currently analyzing the equity value of Shotput Inc., which they believe may be a potential takeover target for some of its rivals. Three of the analysts, Jeff Capes, CFA, Sven Karlson, CFA, and Zydrunas Savickas, CFA, are using the dividend discount model to try to value the company.

Jeff Capes, CFA, decided to use the constant growth Dividend Discount Model (DDM) to estimate the equity value. He is using the following information from Shotput's financial statements for the year just ended:

Income Statement	$m
Revenues	850
COGS	580
SG & A	200
Depreciation expense	50
Earnings before tax	20
Taxes	10
Net income	10
Dividend	6

Balance Sheet	$m
Cash	10
Accounts receivable	450
Prepaid expenses	50
Fixed assets	400
Total assets	**910**
Current liabilities	550
Long-term debt	156
Equity	204
Total liabilities & equity	**910**

In order to calculate Return on Equity, Jeff calculates and uses the opening equity figure of $200m.

Capes has identified a company in the same industry, Discus Inc., which has the same size and risk characteristics as Shotput. He has decided to use the following information on Discus to estimate a required return for equity holders of Shotput:

Equity market value	$62.94m
Dividend just paid	$5.5m
Sustainable growth rate	3%

Capes is also interested in calculating the present value of growth opportunities (PVGO) for Shotput. He is proposing to use the last dividend paid by Shotput and divide it by the required rate of return to get the value of its assets in place, and compare this to the fundamental value to get PVGO.

Sven Karlson, CFA, is also estimating an equity value for Shotput using the DDM. He has estimated a required return for equity of 11% using the Capital Asset Pricing Model. He has also picked up the dividends just paid as $6m from the financial statements.

Karlson, however, is uncertain about how dividends will grow and feels that Shotput has a competitive advantage over its rivals in the short term, which will lead to increased dividend growth for the next few years. He has therefore assumed that for the first three years the dividend growth rate will be 7% p.a., and then will decline linearly over the next six years to 2% p.a., a growth rate that will then be sustained for the foreseeable future.

Zydrunas Savickas, however, has questioned the use of the DDM for the purposes of their research. They are hoping to present their findings to one of Shotput's competitors who they feel may be in a position to launch a takeover bid and realize a gain from Shotput's current undervaluation.

Savickas states, "While I accept that a benefit of the dividend discount model is that the resulting valuation is not very sensitive to changes in the required rate of return assumption, as we are looking at a potential takeover, it may be more appropriate to consider a free cash flow model. The dividend discount model is most appropriate from the perspective of a minority shareholder."

67. (B) $61.2m.

Explanation

$P_0 = D_0 (1 + g)/(r - g)$

$g = RR \times ROE = (\$4m / \$10m) \times (\$10m / \$200m) = 0.4 \times 0.05 = 0.02$

Using information re: Discuss and rearranging the DDM:

$r = d_0(1 + g) / P_0 + g$

$r = \$5.5m(1.03) / \$62.94m + 0.03 = 0.12$

$P_0 = \$6m(1.02) / (0.12 — 0.02) = \$61.2m$

(Module 20.2, LOS 20.f)

Related Material

SchweserNotes - Book 3

68. (C) $87m.

Explanation

This is three-stage growth with linear decline during the second stage.

Step 1: Calculate the H model at T_3:

$$P_3 = \left[D_3 \times (1 + g_l)\right] / (r - g_l) + \left[3_0 \times H \times (g_h - g_l)\right] / (r - g_l)$$

$P_3 = [\$6m(1.07)^3 \times (1.02)] / (0.11 — 0.02) + [\$6m(1.07)^3 \times 3 \times (0.07\ 0.02)] / (0.11 — 0.02)$

$P_3 = \$83.3m + \$12.25m$

$P_3 = \$95.55m$

Step 2: Discount H model value back to T_0:

$\$95.55m / 1.11^3 = \$69.87m$

Step 3: Discount the dividends relating to the first stage:

Dividend stream = $6(1.07) + 6(1.07)^2 + 6(1.07)^3$

Dividend stream = $6.42 + 6.87 + 7.35$

PV = $6.42 / 1.11 + 6.87 / 1.11^2 + 7.35 / 1.11^3$

PV = $5.78 + 5.58 + 5.37$

PV = $16.73m

Adding Step 2 and Step 3 together:

P_0 = $69.87m + $16.73m

P_0 = $86.6m ($87m to the nearest $m)

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

69. (A) **He is correct about the minority perspective, but not the sensitivity to the required rate of return assumption.**

Explanation

The DDM is more appropriate for a minority shareholder. After a takeover, the acquirer will have control over the dividend policy and hence a FCF model is more appropriate. However, a DDM valuation is very sensitive to changes in the input assumptions.

(Module 20.1, LOS 20.b)

Related Material

SchweserNotes - Book 3

70. (B) **The value of assets in place is given by earnings divided by the required rate of return.**

Explanation

The value of assets in place is E / r. The difference between this value and the fundamental value is PVGO.

(Module 20.2, LOS 20.g)

Related Material

SchweserNotes - Book 3

71. (B) **quantity of computations.**

Explanation

Computations are no simpler or more complicated on a spreadsheet as opposed to a calculator. Accuracy tends to be improved with the use of a spreadsheet, because you don't have to punch numbers into a calculator at any stage. However, someone truly concerned with accuracy can do a fine job with a calculator. The spreadsheet stands out when it comes to quantity. Analysts can program many permutations and scenarios into a spreadsheet, using minutes to do what would take hours or even days or weeks with a calculator.

(Module 20.2, LOS 20.o)

Related Material

SchweserNotes - Book 3

72. (A) **negative.**

Explanation

The Gordon growth model $P_0 = DPS_1 / (r - g)$ will not work if the growth rate is greater than or equal to the required rate of return. Negative growth rates are acceptable in the Gordon growth model.

(Module 20.2, LOS 20.e)

Related Material

SchweserNotes - Book 3

73. (B) **$16.22.**

Explanation

The value of the shares = ($16.00 + $2.00) / (1 + 0.11) = $16.22

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

74. (C) **$78.**

Explanation

The value of the preferred is $78:

V_0 = ($100par x 7%) / 9% = $77.78

(Module 20.2, LOS 20.d)

Related Material

SchweserNotes - Book

75. (A) **unable to determine value using Gordon model.**

Explanation

The Gordon growth model cannot be used if the growth rate exceeds the required rate of return.

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

76. (B) $29.34.

Explanation

JAD's stock price today can be calculated using the three-stage model. Start by finding the value of the dividends for the next four years with the two different dividend growth rates.

$D_1 = D_0(1 + g) = \$0.80(1.25) = \$1.00$

$D_2 = D_1(1 + g) = \$1.00(1.25) = \$1.25$

$D_3 = D_2(1 + g) = \$1.25(1.15) = \$1.4375$

$D_4 = D_3(1 + g) = \$1.4375(1.15) = \$1.6531$

(Alternatively, you could use your financial calculators to solve for the future value to find D_1, D_2, D_3, and D_4.)

Next find the value of the stock at the beginning of the constant growth period using the constant dividend discount model:

$$P_4 = \frac{D_5}{r - g}$$

CAPM:

$r = 0.04 + [1.4 \times (0.10 - 0.04)] = 0.124$

$D_5 = D_4 \times (1 + g) = \$1.6531 \times 1.08 = \$1.785$

$$P_4 = \frac{D_5}{r - g} = \frac{\$1.785}{0.124 - 0.08} = \$40.57$$

The easiest way to proceed is to use the NPV function in the financial calculator.

$CF_0 = 0$; $CF_1 = 1.00$; $CF_2 = 1.25$; $CF_3 = 1.4375$; $CF_4 = 1.6531 + 40.57 = 42.22$

I = 12.4; NPV = 29.34

The value of the firm today is $29.34 per share.

(Module 20.1, LOS 20.b)

Related Material

SchweserNotes - Book 3

Jakzach Corp. is a U.S.-based company. Exhibits 1-3 present the financial statements, which are prepared according to U.S. GAAP, and related information for the company. Exhibit 4 presents relevant industry and market data.

Exhibit 1

Jakzach Corp. Summary Balance Sheets on 31 December (U.S. $ millions)		
	20x6	20x5
Cash	$13.00	$5.87
Accounts receivable	30.00	27.00
Inventory	209.06	189.06
Current assets	$252.06	$221.93
Gross fixed assets	474.47	409.47
Accumulated depreciation	(154.17)	(90.00)
Net fixed assets	320.30	319.47
Total assets	**$572.36**	**$541.40**
Accounts payable	25.05	$26.05
Notes payable	0.00	0.00
Current portion of long-term debt	0.00	0.00
Current liabilities	$25.05	$26.05
Long-term debt	240.00	245.00
Total liabilities	$265.05	$271.05
Common stock	160.00	150.00
Retained earnings	147.31	120.35
Total shareholders' equity	$307.31	$270.35
Total liabilities and shareholders' equity	**$572.36**	**$541.40**

Exhibit 2

Jakzach Corp. Summary Income Statement for the Year Ended 31 December 20X6 (U.S. $ millions)	
Revenue	$300.80
Total operating expenses	(173.74)
Operating profit	127.06
Gain on sale	4.00
Earnings before interest, taxes, depreciation, and amortization (EDITDA)	131.06
Depreciation and amortization	(71.17)
Earnings before interest and taxes (EBIT)	59.89
Interest	(16.80)
Income tax expense	(12.93)
Net income	30.16

Exhibit 3

Jakzach Corp. Common Equity Data for 20x6	
Dividends paid (U.S. $ millions)	$3.20
Weighted average shares outstanding during 20x6	16,000,000
Dividend per share	$0.20
Earnings per share	$1.89
Beta	1.80

Note: The dividend payout ratio is expected to be constant.

Exhibit 4

Industry and Market Data 31 December 20x6	
Risk-free rate of return	4.00%
Expected rate of return on market index	9.00%
Median industry price/earnings (P/E) ratio	19.90
Expected industry earnings growth rate	12.00%

The portfolio manager of a large mutual fund comments to one of the fund's analysts, Katrina Preedy:

"We have been considering the purchase of Jakzach Corp. equity shares, so I would like you to analyze the value of the company. To begin based on Jakzach's past performance; you can assume that the company will grow at the same rate as the industry."

77. (B) $22.40.

Explanation

The value of a share of Jakzach equity using the Gordon growth model and the capital asset pricing model is $22.40.

The value is calculated as follows:

Calculate the required rate of return using the capital asset pricing model.

$r = R_f + \text{beta} \times (E(R_m) — R_f)$

$R_f = 4.0\%$

$E(R_m) = 9.0\%$

$\text{Beta} = 1.8$

$r = 4.0\% + 1.8 \times (9.0\% — 4.0\%)$

$r = 13.0\%$

Calculate the share value using the Gordon growth model.

D_0 = \$0.20
g = 12.0%
r = 13.0%
V_0 = (D_0 x (1 + g)) / (r — g)
V_0 = (\$0.20 x (1 + 0.12)) / (0.13 — 0.12)
V_0 = \$22.40

Professor's Note: You are given the dividend per share (\$0.20) in Exhibit 4, but you are also given total dividends in millions of \$ (\$3.20). It would have been very easy to mistake total dividends for dividends per share and arrive at the wrong answer.

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

78. (B) 10.03%.

Explanation

See answer 3.

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

79. (B) 0.56.

Explanation

The three components of Jakzach's return on equity, using the DuPont model and net income, are:

Profit margin = 10.03%
Asset turnover = 0.56
Financial leverage = 2.00

The components are calculated as follows:

Net income = \$30.16 million
Sales = \$300.80 million
Total assets = \$541.40 million
Beginning equity = \$270.35 million

Profit margin = net income / sales = \$30.16 / \$300.80 = 10.03%
Asset turnover = sales / total assets = \$300.80 / \$541.40 = 0.56
Financial leverage = total assets / beginning equity = \$541.40 / \$270.35 = 2.00

Professor's Note: The default position when calculating ROE is to use opening balance sheet values in equity analysis. This contrasts with the use of average in financial reporting analysis. In equity analysis, we are concerned with the return generated on the net assets in place at the start of the year.

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

80. (C) 10%.

Explanation

The sustainable growth rate of Jakzach is 9.97%, calculated as follows:

g = b x ROE = earnings retention rate x ROE
= (1 – payout ratio) x ROE
= (1 – dividends / net income) x (net income / beginning equity)
= (1 – ($3.20 / $30.16)) x ($30.16 / $270.35)
= 0.0997
g = 9.97%

Using DuPont model results from above and per share data provided in question:

Payout ratio = $0.20 / $1.89 = 10.58%
ROE = 10.03% x 0.56 x 2.00 = 11.23%
g = (1 – 0.1058) x 11.23% = 10.04%
g = 10.04%

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

81. (B) earnings retention rate times the return on equity.

Explanation

The formula for sustainable growth is: g = b x ROE, where g = sustainable growth, b = the earnings retention rate, and ROE equals return on equity.

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

82. (C) to equity holders.

Explanation

FCFE models attempt to estimate the value of the firm to equity holders. The models take in to account future cash flows due to others, including debt and taxes, and amount required for reinvestment to continue the firm's operations.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

83. (A) 5.0%.

Explanation

Required return = risk-free rate + beta (expected equity market return – risk-free rate)

9% = risk-free rate + 0.8(0.10 – risk-free rate)

9% = 0.08 + 0.2 (risk-free rate)

1% / 0.2 = risk-free rate = 0.05 or 5%

(Module 20.2, LOS 20.h)

Related Material

SchweserNotes - Book 3

84. (A) the same as the required return.

Explanation

A fairly priced asset would be one that has an expected HPR just equal to the investor's required return.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

85. (A) The H-model.

Explanation

The H-model is the best answer, as it avoids an immediate drop to 6% like a two-stage would. The Gordon growth model would not be appropriate.

(Module 20.3, LOS 20.l)

Related Material

SchweserNotes - Book 3

UC Inc. is a high-tech company that currently pays a dividend of $2.00 per share. UC's expected growth rate is 5%. The risk-free rate is 3% and market return is 9%.

86. (C) 1.20.

Explanation

40.38 = 2.10 / (r – 0.05)

r = 2.10 / 40.38 + 0.05 = 0.1020

From CAPM:

r = 0.03 + b(0.09 – 0.03)

0.1020 = 0.03 + 0.06b

b = 1.20

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

87. (C) $44.49.

Explanation

From CAPM:

$r = 0.03 + (0.09 - 0.03)$

$r = 0.03 + 1.12(0.06)$

$r = 0.0972$

$V_0 = D_1 / (r - g)$

$= 2.00(1 + 0.05) / (0.0972 - 0.05)$

$= 2.10 / 0.0472 = \$44.49$

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

88. (C) $50.87.

Explanation

$D_1 = 2(1.10) = 2.20$

$D_2 = 2.20(1.10) = 2.42$

$D_3 = 2.42(1.10) = 2.662$

$D_4 = 2.662(1.05) = 2.795$

$V_3 = D_4 / (r - g)$

$= (2.795) / (0.0972 - 0.05)$

$= 59.22$

$V_0 = [2.20 / 1.0972] + [2.42 / (1.0972)^2] + [(2.662 + 59.22) / (1.0972)^3]$

$= \$50.87$

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

89. (A) $47.67.

Explanation

Given:

$D_0 = 2.00$; $g_L = 0.05$; $g_S = 0.10$; $H = (3/2) = 1.50$; and $r = 0.0972$

$V_0 = \{[D_0(1 + g_L)] + [D_0 \times H \times (g_S - g_L)]\} / (r - g_L)$

$V_0 = [2(1.05) + 2(1.50)(0.10 - 0.05)] / (0.0972 - 0.05)$

$= 2.25 / 0.0472 = \$47.67$

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

90. (B) the investor takes a minority ownership perspective.

Explanation

The discounted dividend approach is most appropriate for valuing dividend-paying stocks in a company that has an rational dividend policy with a clear relationship to the company's profitability, and where the investor takes a minority ownership (non-control) perspective. A free cash flow approach may be appropriate when a company's dividends differ significantly from FCFE. The residual income approach is most useful when a company's free cash flow is negative.

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

91. (A) undervalued.

Explanation

The justified trailing P/E or P_0/E_0 is V_0/E_0, where V_0 is the fair value based on the stock's fundamentals. The justified trailing P/E is given as 15, so the fair value V_0 based on an E_0 of \$3.00 can be computed as 15 x 3.00 = \$45.00. Thus at a market price of \$40.38, UC Inc. is undervalued by slightly more than 10%.

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

92. (C) \$53.00.

Explanation

The value of the firm's stock is: \$4 x [1.06 / (0.14 – 0.06)] = \$53.00

(Module 20.2, LOS 20.c)

Related Material

SchweserNotes - Book 3

93. (A) A two-stage model.

Explanation

A firm that is expected to experience two growth stages with a fixed rate of growth for each stage should be evaluated with a two-stage dividend discount model.

(Module 20.3, LOS 20.l)

Related Material

SchweserNotes - Book 3

94. (C) undervalued.

Explanation

The value per share using the estimates is $35.33 = [$2.00(1.06) / 0.12 – 0.06)]. This is higher than the current share price.

(Module 20.3, LOS 20.j)

Related Material

SchweserNotes - Book 3

95. (A) PVGO.

Explanation

No matter which dividend discount model we use, we have to estimate a terminal value at some point in the future. There are two ways to do this: using the Gordon growth model and the market multiple approach (i.e., a P/E ratio).

(Module 20.3, LOS 20.m)

Related Material

SchweserNotes - Book 3

96. (B) $76.92.

Explanation

The current value of the shares is $76.92:

V_0 = ($100 x 0.05) / 0.065 = $76.92

(Module 20.2, LOS 20.d)

Related Material

SchweserNotes - Book 3

97. (C) $20.95.

Explanation

Use the H-Model to value the firm. The H-Model assumes that the initial growth rate (g_a) will decline linearly to the stable growth rate (g_n).The high growth period is assumed to last 2H years. Hence, the value per share

$= DPS_0(1+g_a)/(r-g_n)+DPS_0 \times H \times (g_a-g_n)/(r-g_n)$

(1.5 x 1.05) / (0.152 - 0.05) + [1.5 x (5 / 2) x (0.20 - 0.05)] / (0.152 - 0.05)
1.575 / 0.102 + 0.5625 / 0.102

15.44 + 5.51 = $20.95

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

98. (A) 6.3.

Explanation

The dividend payout ratio (1 – b) is 0.60, so the retention ratio (b) is 0.4.

$$\frac{(0.60)(1+0.05)}{0.15-0.05} = 6.30$$

(Module 20.2, LOS 20.h)

Related Material

SchweserNotes - Book 3

99. (C) indefinitely without altering the firm's capital structure.

Explanation

Sustainable growth is the rate of earnings growth that can be maintained indefinitely without the addition of new equity capital.

(Module 20.3, LOS 20.p)

Related Material

SchweserNotes - Book 3

100. (B) –0.4%

Explanation

The holding period return = ($0.96 + $9.00 / $10.00) – 1 = –0.004 or 0.4%

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

101. (C) $28.75.

Explanation

Using the Gordon growth model, the value per share = DPS_1 / (r – g)

= 2.30 / (0.12 – 0.04) = $28.75.

(Module 20.1, LOS 20.b)

Related Material

SchweserNotes - Book 3

102. (A) higher than the required return.

Explanation

Alpha returns are returns in addition to the required returns, so the expected HPR would be higher than the required return.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

103. (C) decrease.

Explanation

The required rate of return is used in the denominator of the equation. Increasing this factor will decrease the resulting value.

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

104.

(C)	Incorrect	Incorrect

Explanation

Dividend discount models can be used to calculate required returns, assuming you have the stock price, dividends, and dividend-growth rates, so Hatchett is wrong. Strong is right about the fact that a DDM can calculate required returns, but wrong about the growth rate assumption. Multistage dividend discount models can account for expected changes in the growth rate.

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

105. (C) 2.7%.

Explanation

Equity risk premium = 2.0% + 5.5% — 4.8% = 2.7%

(Module 20.3, LOS 20.i)

Related Material

SchweserNotes - Book 3

106. (C) transitional stage.

Explanation

The second stage is often referred to as the transitional stage. During the transitional stage, the firm's growth begins to slow as competitive forces build.

(Module 20.3, LOS 20.k)

Related Material

SchweserNotes - Book 3

107. (A) under an almost infinite variety of scenarios.

Explanation

Multi-stage dividend discount models are very flexible, allowing their use with an almost infinite variety of growth scenarios.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

108. (A) 10.7.

Explanation

The justified leading P/E is 10.7:

$P_0/E_1 = (D_1 / E_1) (r – g) = (\$0.75 / \$3.50) / (0.13 — 0.11) = 10.71$

(Module 20.2, LOS 20.h)

Related Material

SchweserNotes - Book 3

109. (B) EBIT/interest expense.

Explanation

SGR = b x ROE

where:

b = earnings retention rate = (1 – dividend payout rate)

ROE = return on equity

The SGR is important because it tells us how quickly a firm can grow with internally generated funds. A firm's rate of growth is a function of both its earnings retention and its return on equity. ROE can be estimated with the DuPont formula, which presents the relationship between margin, sales, and leverage as determinants of ROE. In the 3-part version of the DuPont model: ROE = (NI/sales)(sales/assets)(assets/equity)

(Module 20.3, LOS 20.p)

Related Material

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110.

	Benson Orchards	Terra Firm Development
(C)	Yes	Yes

Explanation

To calculate a growth rate using the Gordon Growth model, we use four variables (one being the growth rate itself). If we have any three of the variables, we can solve for the fourth. The four variables are: stock price, dividend, required return, and dividend growth rate. The data presented are sufficient for the calculation of three of the variables for both companies.

Benson Orchards

We know the most recent dividend and the estimate stock return. From the P/E ratio and the trailing profits, we can determine the stock price. From those three pieces of data, we can calculate the dividend growth rate.

Terra Firma

We have the dividend. We can determine the stock price by dividing market value by shares outstanding. We can derive the estimated stock return using the capital asset pricing model. From those three statistics, we can create a Gordon Growth model and solve for the dividend-growth rate.

(Module 20.2, LOS 20.f)

Related Material

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111. (C) net profit margin.

Explanation

(NUEBT)(EBT/EBIT)(EBIT/sales) = (NI/sales) = net profit margin.

(Module 20.3, LOS 20.p)

Related Material

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112. (B) Gordon growth model.

Explanation

The Gordon growth model assumes that dividends grow at a constant rate forever. It is most suited for mature companies with low to moderate growth rates and well-established dividend payout policies.

(Module 20.2, LOS 20.e)

Related Material

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113. (A) 10.9%.

Explanation

The assumed growth rate is 10.9%:

$P_0 / E_1 = (\$0.75/\$3.50) / (0.13 - g) = 10$, $g = 10.86\%$

(Module 20.2, LOS 20.h)

Related Material

114. (C) 8%.

Explanation

GreenGrow's sustainable growth rate is 8%.

g = [1 — ($2/$4)](0.16) = 8%

(Module 20.3, LOS 20.p)

Related Material

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115. (B) $22.22.

Explanation

The required rate of return is (r) = 0.05 + 1.4(0.12 – 0.05) = 0.148

The future dividends are predicted as the following:

Year	Dividend
0	1.50
1	1.50 x 1.2 = 1.80
2	1.80 x 1.18 = 2.124
3	2.124 x 1.16 = 2.464
4	2.464 x 1.09 = 2.686
5	2.686 x 1.08 = 2.900
6	2.901 x 1.07 = 3.103
7	3.103 x 1.04 = 3.227

Now discount the dividend stream to get the value per share. Use the Gordon growth model to discount the constant growth after period 6. Value per share = $(1.8 / 1.148) + (2.124 / 1.148^2) + (2.464 / 1.148^3) + (2.686 / 1.148^4) + (2.900 / 1.148^5) + (3.103 / 1.148^6) + (3.227 / 1.148^6(0.148 – 0.04)) = 22.22$.

(Module 20.1, LOS 20.b)

Related Material

SchweserNotes - Book

116. (B) 17.42%.

Explanation

The Gordon Growth model is as follows:

Price = [dividend x (1 + dividend growth rate)] / [required return - growth rate]

55 = [2.15 x 1.13] / [required return – 0.13]

55 = 2.4295 / [required return – 0.13]

22.6384 = 1 / [required return – 0.13]

[Required return – 0.13] = 0.04417

Required return = 0.17417 = 17.42%

(Module 20.2, LOS 20.f)

Related Material

SchweserNotes - Book 3

117. (B) initial high growth rate declines linearly to the level of stable growth rate.

Explanation

A sudden decline in high growth rate in two-stage DDM may not be realistic. This problem is solved in the H-model, as the initial high growth rate is not constant, but declines linearly over time to reach the stable-growth rate.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

118. (C) equity premiums vary over time with perceived risk.

Explanation

The primary problem with using returns gathered over a long time period is that equity premiums vary over time with the market's perception of risk and relative risk.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

119. (A) $32.60.

Explanation:

The estimated value of GNTX using the H-model is calculated as follows:

$$V_0 = [D_0 \times (1 + g_L) / (r - g_L)] + [D_0 \times H \times (g_S - g_L) / (r - g_L)$$

$$V_0 = [(\$1.40 \times 1.06) / (0.13 - 0.06)] + [\$1.40 \times (6/2) \times (0.25 - 0.06) / (0.13 - 0.06)]$$

$$= \$32.60$$

(Module 20.3, LOS 20.n)

Related Material

SchweserNotes - Book 3

120 (C) P/E ratio, trailing 12-month profits, short-term PEG ratio, long-term PEG ratio, yield.

Explanation

To calculate an implied return using the two-stage DDM, we need the stock price, the dividend, a short-term growth rate, and a long-term growth rate. In the correct answer, we can derive the stock price from the P/E ratio and profits, then derive the dividend from the price and the yield. Given the P/E ratio, we can also distill growth rates using the PEG ratios. Admittedly, earnings-growth rates aren't the same as dividend-growth rates, but analysts routinely use either in their models. More to the point, this is the only answer in which we can come up with even imperfect data for all the needed variables. One choice does not provide us with a way to find the dividend. The other option does not give us the needed short-term and long-term growth rates.

(Module 20.3, LOS 20.i)

Related Material

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121. (C) $133.13.

Explanation

The current value of Apex shares is $133.13:

V_0 = [($6 x 1.08) / 1.10] + [($6 x $(1.08)^2$) / 1.10^2] + [($6 x $(1.08)^2$ x 1.05) / (1.10^2 x (0.10 — 0.05))]

= $133.13

(Module 20.3, LOS 20.n)

Related Material

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Julie Davidson, CFA, has recently been hired by a well-respected hedge fund manager in New York as an investment analyst. Davidson's responsibilities in her new position include presenting investment recommendations to her supervisor, who is a principal in the firm. Davidson's previous position was as a junior analyst at a regional money management firm. In order to prepare for her new position, her supervisor has asked Davidson to spend the next week evaluating the fund's investment policy and current portfolio holdings. At the end of the week, she is to make at least one new investment recommendation based upon her evaluation of the fund's current portfolio. Upon examination of the fund's holdings, Davidson determines that the domestic growth stock sector is currently underrepresented in the portfolio. The fund has stated to its investors that it will aggressively pursue opportunities in this sector, but due to recent profit-taking, the portfolio needs some rebalancing to increase its exposure to this sector. She decides to search for a suitable stock in the pharmaceuticals industry, which, she believes, may be able to provide an above average return for the hedge fund while maintaining the fund's stated risk tolerance parameters.

Davidson has narrowed her search down to two companies, and is comparing them to determine which is the more appropriate recommendation. One of the prospects is Samson Corporation, a mid-sized pharmaceuticals corporation that, through a series of acquisitions over the past five years, has captured a large segment of the flu vaccine market. Samson financed the acquisitions largely through the issuance of corporate debt. The company's stock had performed steadily for many years until the acquisitions, at which point both earnings and dividends accelerated rapidly. Davidson wants to determine what impact any additional acquisitions will have on Samson's future earnings potential and stock performance.

The other prospect is Wellborn Products, a manufacturer of a variety of over-the-counter pediatric products. Wellborn is a relatively new player in this segment of the market, but industry insiders have confidence in the proven track record of the company's upper management who came from another firm that is a major

participant in the industry. The market cap of Wellborn is much smaller than Samson's, and the company differs from Samson because it has grown internally rather than through the acquisition of its competitors. Wellborn currently has no long-term debt outstanding. While the firm does not pay a dividend, it has recently declared that it intends to begin paying one at the end of the current calendar year.

Select financial information (year-end 2005) for Samson and Wellborn is outlined below:

Samson:

Current Price:	$36.00
Sales:	$75,000,000
Net Income:	$5,700,000
Assets:	$135,000,000
Liabilities:	$95,000,000
Equity:	$60,000,000

Wellborn:

Current Price:	$21.25
Dividends expected to be received at the end of 2006:	$1.25
Dividends expected to be received at the end of 2007:	$1.45
Price expected at year-end 2007:	$27.50
Required return on equity:	9.50%
Risk-free rate:	3.75%

Other financial information:

One-year forecasted dividend yield on market index:	1.75%
Consensus long-term earnings growth rate:	5.25%
Short-term government bill rate:	3.75%
Medium-term government note rate:	4.00%
Long-term government bond rate:	4.25%

It is the beginning of 2006, and Davidson wants use the above data to identify which will have the greatest expected returns. She must determine which valuation model(s) is most appropriate for these two securities. Also, Davidson must forecast sustainable growth rates for each of the companies to assess whether or not they would fit within the fund's investment parameters.

122. (A) 2.75%.

Explanation

The GGM calculates the risk premium using forward-looking or expectational data. The equity risk premium is estimated as the one-year forecasted dividend yield on market index, plus the consensus long-term earnings growth rate, minus the long-term government bond yield. Note that because equities are assumed to have a long duration, the long-term government bond yield serves as the proxy for the risk-free rate.

Equity risk premium = 1.75% + 5.25% - 4.25% = 2.75%

(Module 20.1, LOS 20.a)

Related Material

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123. (C) $25.29.

Explanation

The value of Wellborn using a two-period DDM is:

($1.25 / 1.095) + (($1.45 + $27.50) / 1.095^2) = $25.29

(Module 20.1, LOS 20.a)

Related Material

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124. (C) 9.5%.

Explanation

ROE can be calculated using the DuPont formula, which is:

ROE = Net Income / Stockholder's Equity

ROE = (net income / sales) x (sales / total assets) x (total assets / stockholders' equity)

Therefore: ROE = (5,700,000 / 75,000,000) x (75,000,000 / 135,000,000) x (135,000,000 / 60,000,000) = (0.076) x (0.556) x (2.25) = 0.095 = 9.5%.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

125. (C) 11.6%.

Explanation

Utilizing the PRAT model, where SGR is a function of profit margin (P), the retention rate (R), asset turnover (A) and financial leverage (T):

g = P x R x A x T

g = 0.08 x (1 – 0.35) x 1.6 x 1.39 = 0.116 = 11.6%.

(Module 20.1, LOS 20.a)

Related Material

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126. (B) spreadsheet models.

Explanation

The computationally intensive nature of these models make them a perfect application for a spreadsheet program, hence the name spreadsheet models.

(Module 20.1, LOS 20.a)

Related Material

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127. (A) 9.20%

Explanation

The discount rate = risk-free rate + beta (return expected on equity market less the risk-free rate). Here, discount rate = 0.06 + (0.8 x 0.04) = 0.092, or 9.2%.

(Module 20.3, LOS 20.i)

Related Material

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128. (A) are very sensitive to growth and required return assumptions.

Explanation

DDMs are very sensitive to the growth and required return assumptions, and it is often wise to interpret the value as a range rather than a precise dollar amount. There are versions of DDM models that can be applied to companies transitioning from rapid growth to moderate growth, etc.

(Module 20.1, LOS 20.a)

Related Material

SchweserNotes - Book 3

129. (C) H model.

Explanation

The H model assumes a high growth rate during the initial stage, followed by a linear decline to a lower stable growth rate. It also assumes that the payout ratio is constant over time.

(Module 20.3, LOS 20.l)

Related Material

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130. (B) **In the standard two-stage model, a fixed rate of growth is assumed for each stage, while the H-model assumes a linearly declining rate of growth in one stage.**

Explanation

The H-model provides an estimate of the firm's value based on the assumption that the rate of growth will change linearly over the initial stage.

(Module 20.3, LOS 20.l)

Related Material

SchweserNotes - Book 3

131. (A) **15%.**

Explanation

The ROE for Supergro can be determined by solving for ROE in the sustainable growth formula:

ROE = 10% / [1 – ($1/$3)] = 15%

(Module 20.3, LOS 20.p)

Related Material

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