

**INV3701**

(473011)

May/June 2015

INVESTMENTS: EQUITY ASSET VALUATION

Duration : 2 Hours

50 Marks

EXAMINERS :
 FIRST : MS JM NJUGUNA
 SECOND : MISS E BOTHA
 EXTERNAL : MS M DOWELANI

Use of a non-programmable pocket calculator is permissible.

Closed book examination.

This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue.

This paper consists of 26 pages, including the formula sheet (pp 19-21), five sheets of paper for rough work (pp 22-26) and instructions for completing a mark-reading sheet.

You must indicate your student number and the unique number on the mark-reading sheet.

Unique number: 473011

Instructions to students:

1. This exam paper consists of TWO (2) sections:

1	SECTION A	Multiple-choice questions This section must be answered on the mark-reading sheet. PLEASE FOLLOW THE INSTRUCTIONS CAREFULLY.
2	SECTION B	Long questions Use the spaces provided to answer this section. Ensure that you have answered ALL the questions.

2. Please write LEGIBLY and clearly.
 3. Do NOT use SMS language.

TURN OVER

SECTION A – MULTIPLE-CHOICE QUESTIONS

(30 MARKS)

Instructions:

USE FOUR DECIMAL PLACES IN YOUR CALCULATIONS AND THEN ROUND OFF YOUR FINAL ANSWER TO TWO DECIMAL PLACES.

1. A negative return from convergence of price to intrinsic value would *most likely* occur if ...
 1. required return equals expected return.
 2. expected return is greater than required return.
 3. required return is greater than expected return.

2. Which of the following is *least accurate* regarding the going-concern assumption?
 1. Liquidation value is the value of assets sold as a unit.
 2. It assumes the business will continue to operate into the future.
 3. Ordered liquidation value is assets sold with enough time to get better value.

3. An investor buys shares of Local Bank for R65.80 on 1 January 2015, with the intent of holding them for one year. A constant dividend of R0.70 per share is paid by Local Bank on 1 December each year. The investor actually sells the share on 31 January 2015, for R67.40. What is the investor's realised return on the investment over the one month period?
 1. 2.43%
 2. 3.50%
 3. -2.37%

TURN OVER

Use the information below to answer questions 4 to 5.

Zuzu Holdings is a growth company that has never paid a dividend. Free cash flow is forecasted to be negative for the next five years because of Zuzu's aggressive expansion plans. Zuzu has always received a clean audit from its auditors and is generally considered to have high-quality earnings.

Abba Limited is a mature firm that is profitable but operates outside the economy's fastest-growing industries. Its investors seek a minority stake in the firm. Abba's analysts have a 10-year history of the firm paying regular annual dividends.

4. Which of the following models is *most appropriate* to value Zuzu?
 1. Free cash flow model
 2. Residual income model
 3. Dividend discount model

5. Which of the following models is *most appropriate* to value Abba?
 1. Free cash flow model
 2. Residual income model
 3. Dividend discount model

6. Residual income explicitly ... all capital costs.
 1. adds
 2. equals
 3. deducts

The information provided in the table below relates to Nova Limited. Use the information to answer question 7.

	Factor sensitivity	Risk premium (%)
Market factor	1.25	2.6
Value factor	0.85	4.2
Size factor	-1.15	3.7

7. Based on the Fama-French model, calculate the required return for Nova using the above estimates. Assume the risk-free rate of return is 3.5%.
1. 2.50%
 2. 6.07%
 3. 10.32%

Use the information below to answer questions 8 and 9.

Jack and Jill Limited's most recent earnings are R3.50 per share and its dividend payout is 20%. The forecasted constant dividend growth rate is 4% per year to infinity. The firm has a beta of 1.14, given a return on the market index of 8.40% and the government bond yield is 6%.

8. What is the value of Jack and Jill's share using the Gordon growth model?
1. R14.50
 2. R14.77
 3. R15.36

9. The current market price of Jack and Jill's share is R14.22. Based on the share valuation, Jack and Jill's share is ...
1. overvalued.
 2. fairly valued.
 3. undervalued.
10. XYZ Limited is expected to have average earnings per share of R3.10 and will distribute all earnings as dividends. Earnings are not expected to grow in future. Its required rate of return is 7.20% and the current price of XYZ is R78.40. The present value of growth opportunities (PVGO) is ...
1. R35.34.
 2. R43.06.
 3. R75.30.
11. Menlo Limited shares are expected to pay a dividend of R0.80 at the end of year one. The investor expects the price of the shares at the end of one-year holding period to be R51.60. The investor's required rate of return is 14%. Calculate the current value of Menlo Limited shares.
1. R45.02
 2. R45.26
 3. R45.96

12. Pluto is a new firm that currently does not pay dividends. The firm recently reported earnings of R4.50 per share and these earnings are expected to grow at a rate of 12% for the next three years. Pluto will begin to pay dividends from year four to the indefinite future. The firm is expected to have a dividend payout of 15% and to have a constant growth rate of 6%. The required rate of return is 10%. Calculate the value of Pluto shares today.

1. R18.88
2. R21.34
3. R25.13

13. Chico has a book value of R102 per share. The firm's return on new investments (ROE) is 22%, and its required return on equity is 14%. The retention ratio is 20%. Calculate the value of Chico using a single-stage residual income model.

1. R187
2. R238
3. R289

14. An increase in the price to sales (P/S) multiple is as a result of ...

1. decrease in the growth rate.
2. increase in required return.
3. increase in net profit margin.

Use the information below to answer questions 15 and 16.

An analyst predicted that Trek Limited's dividends will continue to grow at its recent rate of 5.40% per year into the indefinite future. The current dividend per share and EPS is R0.96 and R3.20 respectively while the required rate of return on equity is 8.30%.

15. The justified trailing price to earnings (P/E) ratio of Trek Limited is ...
1. 10.34
 2. 10.90
 3. 25.44
16. Trek Limited has a market trailing P/E of 15. Determine whether the share of Trek is overvalued, or undervalued and if you would buy or sell the share.
1. overvalued sell
 2. overvalued buy
 3. undervalued buy

The following information relates to Venus; use it to answer question 17.

Sales	R2 500 000
Total assets	R3 400 000
Financial leverage	0.97
Dividends paid	R195 000
Net income for the year	R650 000

17. Calculate the sustainable growth rate of Venus given the information in the table above.
1. 5.56%.
 2. 12.98%.
 3. 15.78%.

18. Which of the following non-cash charges will result in a decrease in cash flow from operations (CFO)?

1. Amortization of intangible assets
2. An expense from restructuring charges
3. Amortization of long-term bond premiums

Use the following information to answer questions 19 to 20.

Areve Inc has a required rate of return of 9%. The current book value is R8.30. Earnings forecasts for 2016 and 2017 are forecasted to be R1.50 and R2.00 respectively. The dividend payout of Areve is 30%.

19. The ending book value per share for 2016 is closest to:

1. R9.35
2. R9.80
3. R10.25

20. The residual income for the year 2017 is closest to:

1. R1.08
2. R1.12
3. R1.16

21. Olly Capital reports NOPAT of R2 100, a WACC of 14.20% and a return on equity of 17.50%. Invested capital of Olly is R18 000 and the market price of the share is R25. Calculate Olly's economic value added (EVA).

1. R456
2. -R456
3. -R1 050

22. Ricco Systems has 2013 sales of R9 475 and it has 5 233 shares outstanding. The firm's share price as at the financial year end in 2013 was R12.15. The price to sales (P/S) ratio of Ricco Systems for the year ended 2013 is closest to:
1. 1.47
 2. 6.71
 3. 22.00

The information in the table below relate to Rose Bloom Limited. Use the information below to answer question 23.

Year	2012	2013	2014
Earnings per share (EPS)	R1.40	R2.75	R3.40
Book value per share (BVPS)	R16.02	R17.90	R18.50
Return on equity (ROE)	12%	16%	14%

23. Using the method of historical average EPS, calculate the normalised earnings of Rose Bloom.
1. R2.24
 2. R2.52
 3. R2.59
24. An analyst estimates the earnings per share (EPS) of Polar Tech in five years to be R5.50, the EPS in six years to be R6.10 and the median trailing industry P/E to be 21. Calculate the terminal value in year five.
1. R115.50
 2. R128.10
 3. R136.80

25. Which one of the following statements is *most accurate* regarding the price earnings-to-growth (PEG) ratio?
1. Higher PEGs are more attractive than stocks with lower PEGs, all else equal.
 2. Lower PEGs are more attractive than stocks with higher PEGs, all else equal.
 3. Higher PEGs are equally as attractive to stocks with lower PEGs, all else equal.
26. Which of the following statements is *most accurate* regarding the earning yield (E/P) ratio?
1. A low E/P suggests a cheap security.
 2. A high E/P suggests a cheap security.
 3. A high E/P suggests an expensive security.

Use the information below to answer questions 27 and 28.

Meme Inc's book value of assets is R1 450 000, which is financed with R600 000 in debt and R850 000 in equity. Its before-tax cost of debt is 7.10% and its tax rate is 30%. Meme's cost of equity is 11.40%. The following is a summary of its income statement.

Partial income statement for Meme Inc

Earnings before interest and taxes (EBIT)	R142 000
Less: Interest expense	<u>(20 000)</u>
Pretax income	122 000
Less: Income tax expense	<u>(36 600)</u>
Net income	R85 400

27. Meme's equity charge is closest to
1. R66 120
 2. R96 900
 3. R136 834

28. Determine whether Meme is profitable by calculating its residual income.
1. Meme has a residual income of R19 280 and it is creating value.
 2. Meme has a residual income of –R11 500 and it is destroying value.
 3. Meme has a residual income of – R51 434 and it is destroying value.
29. Vino Inc has a required return on equity of 15% and is expected to grow indefinitely at a rate of 6%. The expected return on equity (ROE) that would justify a price to book (P/B) multiple of 1.94 is closest to:
1. 11.46%
 2. 22.13%
 3. 23.46%
30. The P/B ratio is *least suitable* for valuing which one of the following shares? Shares ...
1. of firms that are expected to go out of business.
 2. in mature or cyclical industries and start-up companies with no record of earnings.
 3. of firms primarily hold liquid assets such as finance, investments and banking firms.

END OF SECTION A

Question 2**10 marks**

An analyst following Clean Energy has compiled the following information for the year ended 2014 in preparation for additional analysis to include in a report she has been asked to produce (data is in hundreds of millions of Rands). Clean Energy uses preferred shares, bond and equity financing.

Security type	Market value	Before-tax required return
Preferred share	R300	8.20%
Bonds	R500	6.50%
Shares	R700	13.40%
Total	R1 500	

Preferred share dividends:	R22
Net income available to common shareholders	R140
Increase in investment in working capital	R36
Increase in investment in fixed capital	R58
Loss on sale of an asset	R5
Depreciation	R43
Interest expense	R32.50
Tax rate	30%
Long-term growth rate of FCFF	3.5%

- e) Briefly explain the *two* key factors that would make a firm to prefer to value its cash flows using FCFF instead of FCFE. [2 marks]

- f) An analyst is valuing the equity value of a firm using the FCFE method. She discounts the cash flows using WACC.
Is WACC appropriate to discount FCFE? Justify your answer.

[1 mark]

END OF SECTION B**TOTAL:****(50 MARKS)**

TURN OVER

FORMULA SHEET

<i>Ex ante</i> alpha = Expected holding - period return - required return	
<i>Ex post</i> alpha = actual holding - period return - contemporaneous required return	
$V_0 = \sum_{t=1}^{\infty} \frac{CF_t}{(1+r)^t}$	$E(R_i) = R_F + \beta_i [E(R_M) - R_F]$
CAPM cost of equity = Current long - term bond yield + Stock's beta × Estimated equity risk premium relative to the long - term yield	
GGM equity risk premium estimate = (dividend yield on index based on year - ahead forecasted dividends + consensus long - term earnings growth rate) - current long - term government bond yield	
$E(R_i) = R_F + (\text{risk premium})_1 + (\text{Risk premium})_2 + \dots + (\text{risk premium})_K$	
$E(R_i) = \text{T - bill rate} + (\text{sensitivity to confidence risk} \times 2.59\%)$ - (sensitivity to time horizon risk × 0.66%) - (sensitivity to inflation risk × 4.32%) + (sensitivity to business - cycle risk × 1.49%) + (sensitivity to market - timing risk × 3.61%)	
BYPRP cost of equity = YTM on the company's long - term debt + risk premium	
$V_0 = \frac{D_1}{(1+r)^1} + \frac{P_1}{(1+r)^1}$ $= \frac{D_1 + P_1}{(1+r)^1}$	$r = \frac{D_1 + P_1}{P_0} - 1$ $= \frac{D_1}{P_0} + \frac{P_1 - P_0}{P_0}$
$V_0 = \frac{D_1}{(1+r)^1} + \frac{D_2}{(1+r)^2} + \frac{P_2}{(1+r)^2}$ $= \frac{D_1}{(1+r)^1} + \frac{D_2 + P_2}{(1+r)^2}$	$V_0 = \frac{D_1}{(1+r)^1} + \dots + \frac{D_n}{(1+r)^n} + \frac{P_n}{(1+r)^n}$
$V_0 = \sum_{t=1}^n \frac{D_t}{(1+r)^t} + \frac{P_n}{(1+r)^n}$	$V_0 = \frac{D_1}{(1+r)^1} + \dots + \frac{D_n}{(1+r)^n} + \dots$
$V_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+r)^t}$	$D_t = D_0(1+g)^t$
$V_0 = \frac{D_0(1+g)}{(1+r)} + \frac{D_0(1+g)^2}{(1+r)^2} + \dots + \frac{D_0(1+g)^n}{(1+r)^n} + \dots$	$V_0 = \frac{D_0(1+g)}{r-g}$ $= \frac{D_1}{r-g}$
$V_0 = \frac{D}{r}$	$r = \frac{D_0(1+g)}{P_0} + g$ $= \frac{D_1}{P_0} + g$

$V_0 = \frac{E}{r} + PVGO$	$\frac{P_0}{E_1} = \frac{D_1/E_1}{r-g}$ $= \frac{1-b}{r-g}$
$\frac{P_0}{E_0} = \frac{D_0(1+g)/E_0}{r-g}$ $= \frac{(1-b)(1+g)}{r-g}$	$V_0 = \sum_{t=1}^n \frac{D_t}{(1+r)^t} + \frac{V_n}{(1+r)^n}$
$D_t = D_0(1+g_s)^t$	$V_0 = \frac{D_0(1+g_s)^n(1+g_L)}{r-g_L}$
$V_0 = \sum_{t=1}^n \frac{D_0(1+g_s)^t}{(1+r)^t} + \frac{D_0(1+g_s)^n(1+g_L)}{(1+r)^n(r-g_L)}$	$V_0 = \frac{D_0(1+g_L)}{r-g_L} + \frac{D_0H(g_s-g_L)}{r-g_L}$ $= \frac{D_0(1+g_L) + D_0H(g_s-g_L)}{r-g_L}$
$r = \left(\frac{D_0}{P_0} \right) [(1+g_L) + H(g_s-g_L)] + g_L$	$g = b \times ROE$
$ROE = \frac{\text{Net income}}{\text{Shareholders' equity}}$ $= \frac{\text{Net income}}{\text{Total Assets}} \times \frac{\text{Total assets}}{\text{Shareholders' equity}}$ $= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total Assets}}{\text{Shareholders' equity}}$	
$g = \frac{\text{Net income} - \text{dividends}}{\text{Net income}} \times \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Shareholders' equity}}$	
$\text{Firm value} = \sum_{t=1}^{\infty} \frac{FCFF_t}{(1+WACC)^t}$	Equity value = Firm value - Market value of debt
$WACC = \frac{MV(\text{debt})}{MV(\text{debt}) + MV(\text{equity})} r_d (1 - \text{tax rate}) + \frac{MV(\text{equity})}{MV(\text{debt}) + MV(\text{equity})} r$	
$\text{Equity value} = \sum_{t=1}^{\infty} \frac{FCFE_t}{(1+r)^t}$	$\text{Firm value} = \frac{FCFF_1}{WACC - g}$ $= \frac{FCFF_0(1+g)}{WACC - g}$
$\text{Equity value} = \frac{FCFE_1}{r-g}$ $= \frac{FCFE_0(1+g)}{r-g}$	$FCFF = \text{NI} + \text{NCC} + \text{Intr}(1 - \text{Tax rate}) - \text{FCInv} - \text{WCInv}$ $FCFF = \text{CFO} + \text{Int}(1 - \text{Tax rate}) - \text{FCInv}$
$\text{FCFE} = \text{FCFF} - \text{Int}(1 - \text{Tax rate}) + \text{Net borrowing}$ $= \text{NI} + \text{NCC} - \text{FCInv} - \text{WCInv} + \text{net borrowing}$ $= \text{CFO} - \text{FCInv} + \text{net borrowing}$	$\text{FCFE} = \text{NI} - (1 - \text{DR})(\text{FCInv} - \text{Dep}) - (1 - \text{DR})(\text{WCInv})$

$\begin{aligned} \text{FCFF} &= \text{EBIT}(1 - \text{Tax rate}) + \text{depr} - \text{FCInv} - \text{WCInv} \\ &= \text{EBITDA}(1 - \text{Tax rate}) + \text{Depr}(\text{Tax rate}) - \text{FCInv} - \text{WCInv} \end{aligned}$	
$\text{Firm value} = \sum_{t=1}^n \frac{\text{FCFF}_t}{(1 + \text{WACC})^t} + \frac{\text{FCFF}_{n+1}}{(\text{WACC} - g)} \frac{1}{(1 + \text{WACC})^n}$	
$\text{Equity value} = \sum_{t=1}^n \frac{\text{FCFE}_t}{(1 + r)^t} + \frac{\text{FCFE}_{n+1}}{r - g} \frac{1}{(1 + r)^n}$	
Value of firm = Value of operating assets + Value of nonoperating assets	
Justified price = (Benchmark value of own historical P/Es) × (Most recent EPS)	
$\frac{P_0}{B_0} = \frac{\text{ROE} - g}{r - g}$	$\frac{P_0}{B_0} = 1 + \frac{\text{Present value of expected future residual earnings}}{B_0}$
$\frac{P_0}{S_0} = \frac{(E_0/S_0)(1-b)(1+g)}{r - g}$	$\frac{D_0}{P_0} = \frac{r - g}{1 + g}$
EVA = NOPAT - (C% × TC)	MVA = Market value of company - Total capital
$\begin{aligned} V_0 &= B_0 + \sum_{t=1}^{\infty} \frac{RI_t}{(1+r)^t} \\ &= B_0 + \sum_{t=1}^{\infty} \frac{E_t - rB_{t-1}}{(1+r)^t} \end{aligned}$	$V_0 = B_0 + \sum_{t=1}^{\infty} \frac{(\text{ROE}_t - r) \times B_{t-1}}{(1+r)^t}$
$V_0 = B_0 + \frac{\text{ROE} - r}{r - g} B_0$	$V_0 = B_0 + \sum_{t=1}^T \frac{(E_t - rB_{t-1})}{(1+r)^t} + \frac{P_T - B_T}{(1+r)^T}$
$V_0 = B_0 + \sum_{t=1}^T \frac{(\text{ROE} - r) \times B_{t-1}}{(1+r)^t} + \frac{P_T - B_T}{(1+r)^T}$	$V_0 = B_0 + \sum_{t=1}^{T-1} \frac{(E_t - rB_{t-1})}{(1+r)^t} + \frac{E_T - rB_{T-1}}{(1+r - \omega)(1+r)^{T-1}}$

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